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THE

# Center Line

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# MEET

Howdee, folks, jest a word or two to kinda get acquainted with yuh before we start the Diamond D-8 roundup. Yuh know, our gang down in Division Eight sorta takes a drubbin' (and we can take it) about our cowboys, cowgals, cowmanure, Indians, prairies and what-not, so in keepin' with the spirit you all connect us with, we're gonna try to "go western" every now and then throughout this issue. We hope yuh feel like yuh really know us down hyar when yuh get through a-readin' about and meetin'...

C. W. RENTON, Resident Engineer, presently in charge of Project 47-B(1)-1 at Ekalaka. Charlie was born in Kalispell, Montana, on March 3, 1908 -- is married and has one boy and two girls. He attended high school in Great Falls and after graduating, attended the University of Washington at Seattle for some time. Charlie came back to Montana in 1928 and has been working with the Highway since then. He didn't tell us what his hobby is, but we'll guess it was fishing! It must have been. Stringin' along with Charlie down in Puptown, you can find KEN HASKELL, Acting Project Engineer, JIMMY CLAYTON, Instrumentman, STUB OLIVER, Rodman and HI HOLT, Rodman.

HOBART H. MAHON, Project Bridge Engineer, now located at Wibaux in charge of Pojects 35-B, Units 1 and 2, and 61-C. "Hobe" was born at Glasgow, Montana, on August 8, 1907 -- is married and has one razor and one powder puff. He attended the Montana State College, graduated in 1931, and spent two seasons with the USGLO survey parties. "Hobe" started to work with this spread in June, 1926, and except for six months with the Forest Service has made it his main hobby. As a sideline the "Hobo Engineer" likes to hunt with a scattergun and write poetry -- evidence is produced somewhere within this issue. ELTON STRUNK, acting Bridge Inspector, and FRANK DAVIS, Rodman, complete the trio on their project 'way up in the sticks.

GEORGE B. COOPER, Project Engineer, on Project 328-G(1)-1, Roundup-Forsyth. George was born in Culbertson, Montana, on June 27, 1905. He attended grade and high school there and then started to get higher larnin' at the U of North Dakota. After leaving school in April, 1927, "Soup" worked for the Montana Highway Department during the summer months for four years and has been employed with us constantly. Yes, he's married and has one trailer house that he's either cussin' or cooing over. Favorite flav..excuse -- flower -- Four Roses. Holding down the Forsyth fort with "S oup" are PHILLIP BRITTAIN, Acting Project Engineer, JOHN KENNEDY, Rodman, and AL HOLTON, Chainman.

EARL E. HILL, Acting Project Engineer, on location survey. Earl was born on May 9, 1908, at Heppner, Oregon. He made his home in Miles City before he was one year old and has lived there most of his life.

At an early age he started to work on construction of the Buffalo Rapids Ditch. After that, he took a fling at railroad and highway construction from the contractor's point of view. In 1928, he was taken on by the MHd and after roaming all over the state he is roosting in Miles City again and is probably the only engineer in the state who is glad to be back in "Paradise Gardens" .. after having been up in the Western part of the Treasure State. Earl is married, has three razors and sez his hobby is hunting and fishing. We think his hobby should be -- powder puffs! -- or else getting together with Eddie Cantor. JACK McLANAHAN, Acting Instrumentman, RONNY GRAY, Rodman, and KEN REXFORD, Chainman, provide the rest of the qualities for a locating crew.

CATHERINE AGATHA WAGNER, Senior Typist, was born In Miles City October 3, 1918,being the tenth and last of a series. Unspoiled, however, except mebbe just a little by the Division Eight employees. Agatha attended school in Miles, where she also spent a year as substitute stenno for Judge Nelstead. She has been employed by the MHD for the past three years. Visual statistics: -- 5'3-1/2" tall, 105 lbs., light brown curly hair, freckles. Hobbies: Tennis, ice skating, bowling, swimming -- is a good swing piano player. DEFINITELY a jitterbug. Dislikes being called I-gatha or Agaytha -- prefers Gatha or Susie. Doesn't smoke but will (on a dare) chew snoose, smoke a pipe, cigar, or puff a cigarette without inhaling. She has been heard to say laterly that the bane of her existence at present is being "Susie Snoop", the Division 8 Center Line reporter. (Incidentally, this item was smuggled in by carrier pigeon as "Susie" is evidently a bit modest).

M. R. WICKMAN, Acting Project Engineer, presently located on Project 47-B(1)-2 at Ekalaka. Wick first saw light in Hancock, Michigan, on August 13, 1904. He says before entering Montana, he worked to travel and see the country so therefore he had too many jobs to mention ... we know, however, that after he hit Montana, one of our southeastern Montana cowgals lassoed him and married him before he could get away. Consequently he started to work for this outfit in Billings in 1926, came to Miles City that same year and is still roamin' Div 8 in a trailer house with his wife and one cocker spaniel. Hobby, huntin' rattlesnakes, accidentally or otherwise. For further moral and physical support, FRANK WINSLOW, Rodman, stands side by side with Wick down in Puptown.

C. T. DAVIS, Project Engineer, located on Project 262-D(1)-1 at Broadus. Clause was born in Columbus, Montana, on November 23, 1908, is married and has two boys and two gals all too-good-looking to be in the same family. Claude spent two seasons with the Public Roads Administration, two years with American T. and T. Co., and one season with S. Birch and Sons Construction Co., learning the contracting business. He started working with this department ten years ago and can capably take care of either maintenance or construction work. Hunting and fishing (when the opportunity presents itself( are Claude's main hobbies. We have heard, by the old grapevine, that he's also pretty good at pitchin' ripe tomatoes.

WILLIAM K. BRITTAIN, Project Engineer, located on maintenance in Miles City. Bill first cast his eyes on this bewildering world thirty-four years ago in Estill Springs, Tennessee. Before he was a year old,

his family moved to Wyoming, but seeing a much better looking state to the north, they moved to Billings and Bill spent his childhood days there. When he was but seventeen, Bill started his engineering career on an irrigation project under the supervision of R. H. Fifield, who was engaged in private engineering. Bill spent four years in this line and in 1927 started working on construction with this department. Bill has had his fling both on construction and maintenance and is another firm believer in "Paradise Valley". He's tall, dark, and married, girls -- his wife sez she has two daughters and one husband that's harder to take care of than the two girls. Bill's hobby is pan -- and playing with the new fizz bottle Santa brought him.

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The Diamond D-8 is a helluva big spread and without the assistance of our roamin' maintenance cowboys, this old division would be a "has been" so get set in your saddle while we try to lasso some of the sectionmen and find out some of their deep dark secrets -- -- -

WILLIAM DEFFERDING, Sectionman at Hillside. Bill was born 32 years ago in Wisconsin, is married and has two datters. He came to Montana in 1932 (to see his mother-in-law, so he says) and before coming to work for this department, hauled U.S. mail during the winter of 1932. In the spring of '33 Bill became entangled with us at Rock Springs and has been with the department ever since. Bill and his very able helper, JOHN HIRSCH, keep their 42 miles on Montana 22 always in shipshape condition for the traveling public.

D. E. ROGERS, Sectionman at Hammond. Ed was born 48 years ago in Annandale, Minn., came to Whitefish, Montana, in 1912 and helped the Great Northern keep their schedules on time by firing for them for two years. Ed must have gotten homesick for good old Minnie, because he returned to that state in 1914 .. but like anyone else who ever hit the Treasure State, he came back to God's country. Ed did his share of time in Uncle Sam's submarine L6 from 1917 to 1919, then came back to work for Rosebud County for six years and started working for the Highway Department in 1930. Ed is the "Lone Cowboy" as far as maintaining section 10 on U.S. 212 is concerned, but he is very much married otherwise.

GUY W. HOUGH, Sectionman at Forsyth. A native of Montana, Guy was born in Lewistown 34 years ago. Guy is very much married and is papa to a boy and a girl. Guy mosied down to eastern Montana, or Paradise Valley as the westerners so fondly call it, in 1923. his work varied from contracting to ranching and before hitting the Highway merry-go-round Guy worked in the grain elevator of Snell Brothers in Miles City. For the past ten years Guy has given his all to the department and in later years SIMON "RED" QUINLIVAN has been the indispensable other half of Guy's team for keeping their section in top condition.

J. E. CLEVELAND, Sectionman at Ekalaka. Jim was born 38 years ago in Ekalaka, is married and has one daughter and one son. Jim gave two years to the Navy, then went into the ranching business for his father for several years. However, after Jim married he took on new courage and decided to "go out on his own" with the results of working for the Gas Development and the Tobbin Construction Company and finally

making the Highway Department in 1929. Jim is another "lone cowboy" out on Montana 7, but he really keeps it on the upbeat for the traveling public.

ERNEST W. PETERSON, Sectionman at Miles City. Pete was born in Sweden 49 years ago, is married and boasts three girls and four boys (and they're all blondes). Pete came to the U.S.A. when he was nineteen; previous to that he took a whirl at fishing (and we don't mean on lakes or mountain streams) and sailing in his native country, and after coming to this country he spent some time in Canada working in lumber camps, then worked in the States maintaing county roads before he came to work for us twelve years ago. Pete's name is "Dependability" when it comes to "Johnny-on-the-spot" whenever the MHD is concerned ... and maybe a few of you up-state fishermen ought to take a few lessons from Pete -- his fish stories are true.

H. F. BEAZLEY, Sectionman at Baker. Hurley was born 40 years ago about 20 miles southwest of Ekalaka, is married and has one fox terrier named Tip. Between the time "Beetles" was four years old until 1918, most of his time was spent in school, when he wasn't on a horse or a horse when he wasn't in school. In 1918 our cowboy enlisted in the Field Artillery and after the Great Battle he returned to Hardin and operated a tractor for the Montana Farming Corporation for two years. Then to Parks Camp, Texas, went Beetles laying pipe line for the Texas Company. Then he threw in a couple of years "seeing America first" in a Model T Ford, then for four years straight he operated a cat for Carter County. In 1928 the Highway Department was blessed with Hurley and with the exceptions of one winter and spring, he's been with us ever since. To say the least, Beetles with the capabilities of H. H. Hoke and J. R. Venell, makes up a trio that certainly keeps U S. 12 and Mont. 7 always in 100% good traveling condition.

GEORGE WOODS, Sectionman located in Section 12 at Jordan. George was born 47 years ago in Caladonia, Minnesota. When he was fourteen years old, his folks moved to La Crosse, Wisconsin. In 1913 George came to Montana, located near Jordan and started farming and stock raising. In 1917 "Woody" went overseas with the 91st Division, returning to the good old U.S.A. in 1919 and going into the sheep racket. George really took a dislike to this business and started farming and buying, trading, and selling horses, which has always been his hobby. In 1928 George started working for the Highway Department and between "Woody", Fred Lamphere, George Sullivan and Ed Murphy, the 79 miles of Mont. 18 and 22 in their section is always in good condition for ridin' high. George is married, has one wife, two gals and a boy. He forgot to mention his other hobby-that of writing poetry -- look it up, if you don't believe us.

T. G. ANDERSON, Sectionman at Fiddleback Ranch, located 42 miles out on U.S. 12. Ted was born 36 years ago in Forsyth. When Ted was 16 years old, he started working for the N.P. as call boy and warehouseman and kept up the good work for eleven years. Ted became restless and started working for Rosebud County on a bridge crew. This lasted for two years, then in 1930 the Highway Department became Ted's hobby -- and here he is...located 42 miles from the division headquarters but always right in there a-pitchin' to keep his section in top shape. Ted is married and has two daughters who already have the future beauty contests cinched.

JAMES COOKIN, Sectionman at Beaverslide, Jim and his Irish accent first entered this world 39 years ago in Columbus Junction, Iowa. He is married and has one boy, 5 years old, who is the rough-neck of Punkin Creek. Jim came to Montana in 1917 and started cowpunchin' from Ismay to the Wyoming Line. After two years of that, the gypsy in him had to have an outlet becuz he got mixed up in the contracting and construction business and wandered through Missouri, Arkansas, Montana North and South Dakota with the Stevens Brothers of Minneapolis and the Linton Construction Company of North Dakota. In 1926 Jim returned to Montana, like all good men do, and started to work for the Highway Department in 1929. Jim and his side-kick, Sydney Jones, hold the fort down on the old Beaverslide for a territory of 44 miles. (P. S. Jim's hobby must be story writing - for reference, read his article on the LO Ranch).

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C. T. BENSON, Sectionman at Broadus, Bill was born in Texas about thirty-one years ago. From Texas he migrated to Oregon, then into Montana where with his family he settled on Powder River in 1917. One reason why Bill can really take our sub-zero weather is because he spent one season with the USGLO in Alaska. Bill has been in Southeastern Montana all his life and has acted as everything from a stock hand to a fourth-class postmaster, finding time between shifts to work on a few contract road jobs. He has been with the highway since May, 1932. He is married, and has one lipstick and one razor. VAY EDWARDS is the other half of Bill's team for keeping U. S. 212 and Montana 8 wide open all the year round.

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ELMER STROM, Sectionman located at Miles City, Elmer was born in Dawson, Minnesota, forty-two years ago. He came to Montana in 1911 and started farming. Then he spent a season working in a smelter at Great Falls and returned to Miles City and worked in the grain elevators for five years. He has been with this department since 1935. He is married and has three girls - his hobby is probably wishing for a boy. When the best is to be had, Elmer is always right on the job pitchin' for our Highway Department.

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JACK E. COLVIN, Maintenance Foreman, Miles City, Jack was born in Melville, Montana, about forth-one years ago, is married, and has one dog named Smoky (he won(t bite, so they say!). Jack travelled over the State in every division with the Oil Crew for eight years, finally weakened and came down to God's country in 1936 and here he is. He never told his hobbies, but we believe reading authentic history stories of famous western characters is his main diversion - and when he's tryin' to fish in Powder River, he's probably wishing he was up in one of the mountain streams in Western Montana.

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ERNEST WILLIAM HIBER, Division Mechanic at Miles City, Ernie was born on a farm near Laurel, Montana, about thirty-nine years ago. When he was eleven years old, his family moved to a farm on the Crow Indian Reservation.

In 1921 Ernie went to Billings, spent four years driving bus for the Motor Transit Co., threw in four years as mechanic for the Mulvaney Motor Company in Billings, two years at Powell, Wyoming, as mechanic, and finally landed with the Highway Department in 1932 as mechanic in Miles City. Our cowpunchin' mechanic is married, has one red-headed lipstick and a blond razor. Ernie hasn't any particular hobby - just likes to smoke good cigars when the patrolman has them, carries snuff that looks like gun powder in his pocket, and plays bridge for blood or money! Aiding and abetting Ernie in the highway shop are Oscar "Sharpshootin'" Olson, Don "Best-man" Herndon, Orville "Stalin" Myhre, T. A. Bovee, (the singin' blacksmith), and Darrell "Goody" Gudmundson, the curly-headed sign painter.

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L. H. MCINTYRE, Gas Distributor and Maintenance Clerk, Mac was born in Great Falls, Montana, twenty-four years ago, is married and has one dog vacationing in Red Lodge. At an early age Mac blew into Miles City and has been here ever since. Previous to his employment with this department, Mac was temporarily air line weather observer at Miles City for some time, later spent two years as cashier and bookkeeper for the Metropolitan Cafe in Miles. In 1936 he started working for this spread. Mac's hobbies are hunting and fishing and spending week-ends up in Red Lodge Country. In fact, that ranch up there in Red Lodge is so fascinating that ever since Mac took his dog up there, the canine refuses to return to "Paradise Valley" - we wonder why?

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G. M. LESTER, Division Clerk, Miles City, Jerry first saw the light of day forty-two years ago in Superior, Wisconsin. He is married, has one son and two daughters - in fact, since those two girls have grown up, the wolves are always at Jerry's door and the old shot-gun is always in its place. Previous to his employment with the highway department, Jerry put in a session with the Wells Fargo Express, CMSt. P & P Ry., and two years in the 14th U. S. Infantry. Jerry has been with this spread at Miles City since 1933. His main hobby is interior decorating his home.

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EMMETTE LEO ADAMS, Janitor, Miles City, Emmett was born in Huntsville, Missouri, on September 13, 1889. Before coming to Miles City, he spent several years in engine service out of Spokane, Washington, on the Northern Pacific Railroad. He came to Miles City twenty-two years ago and up to the time he started to work for this spread he was in engine and train service on the CMSt. P & P Ry. In 1917, he was also in train service in France for eighteen months. Emmett has been holding down his post in the Miles City office since 1934. He is married and has one dog named "Tip". Emmett's main hobby is hunting and Tip.

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Last but not least come the fellahs who really do their part in turning out mass production when it comes to fightin' snow and patchin' oil side by side - without them, the maintenance setup in division eight would still be in three-cornered pants: - Paul Carlson, Bud Cline, Bill Dahl, Dirk Doeden, Roy Eberhart, Spencer Wilson, Alex Fandrich, Vern Metcalf, Mickey Powell, Porter Roberts, Gene Rogers, Bus Welch, and Gordon Wilson. Stick with us, fellahs!

THE WRONG-a-WAY AGENT

One Act -- Short and Sour
(By Earle R. Bunker in American
Right of Way Association News.)

(The scene is an evening in the quiet, average home. Man reading the evening newspaper by a lamp. Door opens. Wife enters. Listens a moment. Calls to rear.)

Wife: I will not bring you another drink. Shut up and go to sleep.

(Enters and closes door.)

Wife: I declare, that kid can stall worse than anything I know.

Husband: Erumph.

Wife: You're welcome. Loosen up with some of that paper. You've had it all night.

(Husband, still reading, pushes handful of paper in general direction of wife, who picks it up from the floor and starts to sort it. Article catches eye. She reads it.)

Wife: (excitedly) Hennery! It says here they're going to open up Grand Boulevard -- the other side of Pine Avenue. Look, they're gonna widen it right along here. It will take some of our property, maybe all of it. Oh! my pansies. Hennery! Are you gonna sit there like a bump on a log and let them do this to us?

(Husband comes to with crash.)

Husband: Do what?

Wife: Our home ruined -- thrown into the street -- our boy -- my pansies! What are yu' gonna do about it?

Husband: What the devil's eatin' you? Dry up and let me ...

(Door bell rings. Wife goes to door, opens it a little.)

Wife: Who is it?

Voice: (from outside) Who wants to know?

(Wife slams door and backs away.)

Husband: (rising) Who was that?

Wife: Some smart guy.

Husband: You shouldn't a done that.

(Door bell rings again insistently. Husband opens door, revealing right of way agent, cigar in mouth.)

Agent: Is this the Hosenpfaffer domicile?

Husband: It is the Hassenpfaffer residence. What ...

(Agent brushes by husband and enters.

Agent: Then you must be Mr. Hasenfifer and this is the Mrs. (indicating with thumb) Yes, I thought so. I am Oscar Whoosit, and the great commonwealth employs me as a negotiator for securing needed private properties for public improvements.

Wife: What ...

Husband: (accusingly) You are a right of way agent.

Wife: Oh.

Agent: That is archaic phraseology, but will suffice for the nonce. May I be seated? Thanks.

(Sprawls in chair and critically surveys room. Knocks cigar ashes on floor. Husband and wife somewhat bewildered. Husband sits on edge of chair. Wife remains standing.

Wife: Well...

Husband: Well ...

Agent: Two wells. That's a lotta water, somebody must be all wet. (Chuckles). You gotta excuse me. I gotta see the funny side of life to carry me through. Taking people's property away from them is tough going.

Wife: Taking people's property?

Husband: Whada yu' mean?

Agent: They're gonna widen Grand Avenue all along here. Plans show that they need 20 feet off the front of your property. (Tosses roll of maps on table). Now, here's where I come in, Mr. Sassunheifer.

Husband: The name is Hassenpfaffer.

Agent: You otta have it changed. Well, anyway, I contact the property owners, like you, and buy the property. Of course, the real estate market is way down and your property wasn't never worth much anyhow, so you needn't think

because we're gonna take some of it that you can retire on what you get. It is up to you to co-operate with the government agencies. Now, we're willing to pay you a hundred bucks for what we take. Here's the papers.

(Husband automatically takes folded papers): But it seems to me ...

(Agent takes papers out of husband's hands, opens them up, and indicates with his finger): You and your wife sign here. That's all it takes and the hundred bucks is yours.

(Husband begins to lose his bewilderment. Starts getting mad)

Husband: Just a minute -- am I to understand that you represent the authorities and that they're taking some of my property and only paying me a hundred dollars?

Wife (bristling): Don't we have anything to say about it? Isn't this a free country? We bought this property and paid for it. We ain't gonna sell it to you or anybody else.

Husband: We don't wanna sell it.

Wife: Twenty feet takes off most of our front yard. How about my pansies? If you think ...

Agent (rising): Just a minute. Here I come, representing your elected officials and ask your cooperation in this matter, but it looks like you ain't gonna cooperate. Lemme tell you this: If you don't sign them papers, we'll condemn.

Husband and Wife (together): Condemn?

Agent: Yeah. We'll file suit, and yu' can't do nothin' about it. If you are smart you'll sign. If you're dumb, like most of them are ...

Wife: If you think Hennery is dumb..

Husband: Listen. I don't know anything about all that stuff but I do know I bought this property and paid for it and you have the gall to offer me a measley hundred dollars and ...

Agent: Well, if you ain't gonna cooperate we'll make it a hundred and fifty. Now that...

Husband: Say, listen. I wouldn't sell you an inch for a hundred and fifty thousand dollars. I don't want the street. I don't want to sell. I don't like you. I don't like the ones that hired you. Now get out.

Agent: Well, if you feel that way about it we'll condemn.

Husband: Condemn and be damned! Get out.

Agent: (going out door) Some people are sure dumb.

(Slams door behind him.)

Wife: (weeping, turns to husband) Oh Hennery, what'll we do? All my pansies ...

(Door opens. Agent sticks his head in)

Agent: As a final offer we will pay you two-fifty.

(Husband picks up book and throws it at agent, who ducks and slams the door).

C U R T A I N

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The above article was submitted by Grant Swaney. In next month's issue we will print the sequel, "The Right of Way Agent".

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SPORTS ACCOUNT 06-2-GLENDIVE

The baseball game in farmer Jones' cow pasture yesterday broke up in the 7th inning when Joe Spivins slid into what he thought was 3rd base.

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Then there was the man who walked up to the bar and said, "I have a quotation to make, quote BURP unquote."

.....

She: "Do you know what a bustle is?"
He: "No."
She: "It's a deceitful seatfull."

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Worry is interest paid on trouble before it is due.

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DIAMOND D EIGHT
HOME RANCH

By "Slim" Sanders, Foreman

Speak of Division Eight and you automatically include southeastern Montana - or perhaps more accurately, southeastern Montana is Division Eight - or you may end the description if you like.

This gentle land and official domain which our aggressive pioneers with determined drinking and fighting wrested from the native redman, is contained wholly within Custer, Carter, Dawson, Rosebud, Fallon, Powder River, Wibaux, and Prairie Counties, in generous portions of Richland, Garfield, and McCone, and is bounded on the east and south by Wyoming and South and North Dakota. Referred to by us natives with consistent affection or sheer desperation as Paradise Garden, and with unwitting jealous ego as the Devil's Hangover by the trout fishing "further westers" of this old state, division eight is, irrespective of such unjust cuts, 27,000 square miles of the sturdiest piece of territory you could wish to lay your peepers on.

Here is where Montana begins (reading from right to left), at least this is the part that the prospective settlers first saw and a few of the more imaginative ones stopped over. We are rolling in plenty of stirring early state history down here, why the Indians used to fight amongst themselves over this part of the country so when the white man came along and tried to take it away from them, they put up a pretty stiff battle. But at that it didn't take long for the army, the buffalo hunter, and the cowman to convert this early Indian hunting mecca into the greatest cattle-raising country in the world. This was the end of the long trail from Texas and hundreds of thousands of longhorns like that old fellow on the front cover were turned loose to get rolling fat off of the luscious native grass. This was and still is cow country. The steers don't wear horns any more and the cowboys and cowgirls raise sugar beets and ride in parades; some of the old cow manure is still here, getting a little worn, these old boys have been tossing the same stuff around so much that it is losing its zip.

A big country with comparably small population scattered from hell to breakfast and bunched in a few small towns. Many of the country seats are without railroad service, consequently, highways are in a number of cases community life lines. On three U. S. and eight state routes, this division maintains 812 miles on the seven percent system and the counties 71 miles on the secondary.

We haven't any lofty snowcapped peaks or clear trout streams with which to suck the tourist in or induce him to linger, but we do have some beautiful badlands and tell me where in Montana is there a stream of more national fame or international renown than old Powder River!

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# EKALAKA

By "THE PUPTOWN BOYS"

Ekalaka, situated in the north central part of Carter County, Montana, is one of the many historical points located in Division Eight. We would like to present a little story on the derivation of its name and give a brief history of the person it was named after.

Ekalaka was and still is one of the old cowtowns of the West. It first became an official dot on the map of Montana Territory on Nov. 27, 1885, when Charles Cartwright was named postmaster. At the time the postal inspector was looking the town over as a site for a post office it was known as the Blue Mud Hills. Not liking the name, the inspector asked David Harrison Russell, the first settler in this locality, the name of his wife. Russell replied "Ijkalaka" which sounded to the inspector as Ekalaka and as a result the town was named Ekalaka.

Ijkalaka or Ekalaka was an Ogallalla Sioux, daughter of Eagle Man and the niece of Red Cloud, who was one of the greatest of Sioux warriors. She was born in Nebraska on the Ogallalla Reservation, where she lived a short time. Her name Ijkalaka means "Wanderer" or "Move Camp Fast" and the name seemed to fit her nature as she was very restless. When her aunt married a white man named Kelly and went to Fort Laramie, Wyoming to live, Ekalaka went with them. As a result of this association she was often called Mary Kelly. It was at Fort Laramie that Ekalaka met and married David Harrison Russell, buffalo hunter and adventurer. They were married on February 14, 1875 and in the month of August, 1881, they moved into what is now Carter County and settled on a place about five miles south east of the present town of Ekalaka, which remained Russells home until he sold it to Frank Buck in 1919. Russell and Ekalaka were the first couple to make a home in this locality, giving Ekalaka the distinction of being the first woman in the country though to Mrs. Harry Yoeman goes the distinction of being the first white woman.

Ekalaka bore Russell thirteen children, eight boys and five girls, of whom eight are still living. Her oldest boy wandered back to the reservation and contracted small pox. He came home for his mother to nurse him and while doing so she contracted the disease and died. This was in the year 1901. She now lies buried on a small hill on their ranch south east of town.

According to some old timers Ekalaka was a very taciturn person and would not talk when around white men but would visit with their wives when they were away. She was a very good nurse and was always on hand during any sickness. By this she won the good will and respect of all the community. There has been talk of erecting a monument to her memory and the old timers believe that time will see it erected when a definite site can be decided upon.

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OVERHEARD AT HIGHSCHOOL
FOOTBALL GAME
By Bill Thomas - Glendive
(Gal gives crowd once over while players battle)

"When does the game start? My goodness I'm so excited. When do the players arrive? There's Mary with a new hat. I'll bet she bought it in Miles City. She sure has class; dresses like a fashion plate even at a football game. What do you mean pay attention? I am.

Look at Betty, the little cat, I just know she's talking about me. I'd like to go up there and tell her! CALM DOWN? I am calm. Oh, the team is the most important and not who I like and dislike. All right!

What silly outfits, my word, you'd think the boys would want to wear something a little more flattering. With those numbers on their shirts they look like members of a chain gang. Give me the field glasses, I thought I saw a good looking guy out there. He took that terrible looking hat off and he really isn't at all bad looking. What do you mean they aren't out there to look handsome? I know they're out there to play football, but I think it's silly, flopping around in the mud for a silly old lopsided ball.

There's the kickoff? Oh, you mean the game has started. Look at Judy. She's yelling so loud you'd think she'd be ashamed. Look at that silly coat she has on. Oh, all right, I'll pay attention. They surely are rough enough. Look at that great big brute picking on that little fellow. Why, he knocked him right over. Did he do that just to get the ball? Oh, he's supposed to stop him....I guess I understand. Now that was silly. I mean that boy with number 44 on his shirt. Those fellows in front of him sneaked up and swiped the ball from the other fellows and tossed it back to him and what does he do, but toss it back to that fellow standing all alone. And why doens't that fellow run the other way, there isn't any one there to bother him. It's an inter---what. Well what did he throw it for then?

Oh, did you say it's the half now? I suppose you mena the game is half over. Look, there goes some girls in uniform. Are they going to perform? This is what I have been waiting for. What do you mean, watch them then and not look at the band. I am watching them, but he's so cute. I wonder if I'll be able to see him after the game and get an introductior?

What's the score now? Six to nothing. How in the world did they make six? They've only crossed that line down there once. Oh, they get six every time they do. I just can't keep my eyes off that boy in the band. Wouldn't he look swell in a tux. Oh, the game is starting again.

He keeps looking at me all the time. He surely is cute...What? Oh, we made another touchdown. I wondered why everyone was yelling so loud. What do you mean they'll kick now, was some one cheating? Oh, do they have to kick the ball between those posts. Football is so complicated. Did you say there was only four minutes left. Thank goodness. I just have to meet that boy in the band. Is it over? Who won? Well, I guess it doesn't make any difference. There he is coming this way. Hello. Yes the game was thrilling. I'd love a coke, then we can talk over the game. I love football; its so interesting and I understand it better than any other game.

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PORTLAND CEMENT
Lyle Swartz - Project Engineer
Division 8.

Cement in the broadest sense, is anything which causes objects to stick together, cement which "sets" and hardens under water as well as in the air is known as "hydraulic cement". Since 1900, Portland cement has been the chief hydraulic cement, and today all but a small percent of the cement used in construction work in the United States is Portland cement.

There is no evidence that the ancient races had any knowledge of cement as it is known today, but at a very early date the Romans used a type of pozzolan cement, which is comparable with modern pozzolan cement, although differing in manufacturing process. The Romans used a volcanic ash found near Naples, and mixed the ash with quicklime. This mixture was very successfully used in the building of the great structures of that day.

Toward the close of the eighteenth century, deposits of clayey rock which would yield a hydraulic cement on calcination at fairly low temperatures were found in France and several parts of the United States. In 1824 Joseph Aspdin, a bricklayer of Leeds, England, invented a cement which would harden under water. The first Portland cement was made by burning crushed limestone with clay or shale at much higher temperatures than those used in burning the natural cements used prior to that time, and pulverizing the clinker like mass. Aspdin called the new material on the Isle of Portland, England.

Portland cement is made from natural deposits, also from an industrial by-product, blast furnace slag, which includes limestone, marl, shells, cement rock, clay, and shale. The four chief ingredients found in these cement materials are lime, silica, iron oxide, and alumina. In any Portland cement these four constituents may vary within certain limits, but the general composition runs approximately 60 to 65% lime, 20 to 25% silica, and 5 to 12% iron oxide plus alumia.

Cement materials, as a rule, are found on or near the earth's surface, and nearly all the material is obtained by quarrying. Although suitable deposits are found in many states, the Lehigh district of Pennsylvania and New Jersey produces one-fourth of all the Portland cement produced in the United States. Natural proportions there are almost exact for cement making.

The terms "wet" or "dry" process are applied in cement making to denote the method of handling the raw materials. The subsequent operations are identical. In both processes the first step is the primary crushing of the broken rock. The quarry rock is broken to fairly uniform pieces, the largest about the size of a baseball. From the primary crusher the rock is carried to the hammer mills, where it is crushed down to pieces no larger than three-quarters of an inch in diameter.

The raw material is next carefully proportioned to include the proper amounts of limestone, clay, shale, or slag, before it goes into the ball-and-tube mills for the final grinding operation. The ball-and-tube mills

are horizontal revolving cylinders lined with corrugated armor plate and partially filled with steel balls. The raw material is pulverized by the constant pounding of the steel balls as the cylinders revolve. The raw mix is ready for the burning process after it leaves the ball-and-tube mills.

The cement is burned in rotary kilns, the material being heated to above 2,300 degrees Fahrenheit. At the peak temperature the material becomes incandescent and emerges from the kiln in the form of partially vitrified, hard, uneven lumps called clinkers. After cooling, the clinker is ground in the finishing mills, a small amount of gypsum not exceeding 3% by weight is added to the clinker to control the degree of fineness and the time of setting when the cement is used in concrete.

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On January 22nd Lyle Swartz, Project Engineer, Ray Minette, Instrumentman, Curtis McKenzie, Rodman, and Bernard Angstman, Chainman, arrived in Division 10 to stake project FAP 68-B(2) & C(2), Livingston-Clyde Park. With the exception of the latter, who comes from Missoula, the party claims Miles City as their previous residence.

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LIFE IS LIKE THAT

Some time ago, out east of Jordan, the road crew had to plank a bridge. Each man took his turn at stopping the cars that came along and warning them of the condemned bridge. Everything went well, however, until one of the crew stopped an old rattle-trap of a car. Pointing to the front wheels and fully explaining, the road worker told them to put this wheel on this plank and that wheel on that plank and cross the bridge. Satisfied with his instructions, the worker turned to resume his work, but someone was talking to him. Looking back he saw the driver of the automobile looking blankly out of the window and asking, "Where do we put the back wheels?"

+

Mr. and Mrs. Vern Metcalf and two sons returned recently to Miles City from a one month's trip to Durand, Wisconsin and the Twin Cities. They traveled by auto and Vern states that their trip was perfect as far as roads and weather were concerned -- just one flat tire was his only lament. While on their vacation trip, both Vern and his wife attended family reunions of their families, the occasion being the first time in twenty years that both families were reunited.

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Dirk Doeden, another one of our roaming maintenance men, and his wife and son Jerry, journeyed down to Missouri, Nebraska, Wyoming and back again recently. Dirk reports an enjoyable time in every way and says he is one up on Vern Metcalf because they didn't even have a flat tire. Nice goin', Dirk.

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George sez: "When you learn that you don't know anything, then you're getting smart."

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THE NEXT ISSUE OF CENTER LINE WILL BE THE DIVISION NINE NUMBER -- LET'S GO, LEWISTOWN.

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## Meet the Glendive District

C. J. (RED PETE) PEDERSON, Maintenance Foreman, Pete was born in Baldwin, Wisconsin, December 21, 1891. Since the age of 16, Pete has spent most of his life in the construction and maintenance of highways. Before going to work for the Department he contracted grading and surfacing of highways and railroad grading in Montana, Minnesota, North Dakota, Wyoming, Texas, Washington, and Canada. He first worked for the Highway Department in 1923 as a blademan at Livingston. Going back to his first love, he contracted around Montana until 1929. In 1929 he again went to work for the Highway Department in the Glendive District, where he has been employed since. Pete served in the 164th. Infantry in the big scrap over there, and with the 3rd. Cavalry in the ruckus Down Mexico Way. He is married and has one little powder puff.

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LOUIS MOHOLT, District Mechanic, Louie was born Roras (Rerros) Norway, November 22, 1902. Came to the United States with his parents in 1903, and settled in northern Wisconsin. Louie's papa homesteaded on Deer Creek, in Dawson County, Montana, in 1911, and Louie started growing up to be a native. Since homesteading with his papa, he has spent his entire life in and around Glendive, with the exception of three years spent in Souix Falls, South Dakota, as a mechanic for the Cadillac service in that town. Louie was employed as a mechanic in several garages around Glendive, and worked for Dawson County for three years in the same capacity. Started working for the Highway Department August 24, 1931, as a mechanic and motor patrol operator. He was appointed as District Mechanic May 16, 1938. He is married and has two boys and one girl.

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BRYCE L. YOUNG, Mechanic, Bryce was born in Saskatoon, Saskatchewan, Canada, (believe it or not) June 3, 1902. In 1906 the entire Young family moved to Arkansaw, lived there for four years and in 1910, moved to Montana, settling in Glendive. Bryce finished grade school and highschool in the Glendive Schools. After leaving school Bryce went to work for the Ford Motor Co. in Glendive. In 1927 he moved to Miles City and was employed by the Ford Motor Co. of that City. To make it three in a row he moved to Missoula and worked for the Ford Motor Co. there. BUT! You can't keep a good man down. He returned to Miles City and once more entered the employ of the Ford Motor Co. Thats that. Bryce entered the employ of the Highway Department February 16, 1939, at Miles City and was transferred to the Glendive shop May 18, 1938. He is married and has two children. One boy and one girl.

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W. W. THOMAS, Gas Distributor and Office flunky, Bill was born in Radley, Kansas, May 6th, 1909, which makes him free white and 30. Went to grade school and Highschool in Independence, Kansas, and watched Alf Landon grow from an oil field operator into the Governor of Kansas. Learned the vulcanizing trade during summer vacations and evenings after school. Lived in, and worked at his trade in Kansas, Oklahoma, Arkansaw,

Louisiana, and Missouri, until June 1929. Bill moved to Montana, to join his father at Livingston, June 9, 1929. He worked there at the vulcanizing trade, the Bridge & Building and Signal Departments for the Northern Pacific, and with his father in the building construction business. Moved to Glendive and started work for the Highway Department as a gravel checker, October 21, 1931. Worked on construction until April 1935 and transferred to the Maintenance Department as Gasoline Distributor in the Glendive District. He likes to play baseball, basketball, and Solo. Has only one hobby-----Feme Sole, and has no wife and no children.

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I. G. SWEENY, Sectionman, Terry, Montana, Sweeny was born June 4th, 1888, in Chippewa Falls, Wisconsin. His Dad immediately put him to work in the lumbercamps of that state. Among these camps were the Fountain Campbell Company, the Kiser Company, and the Chippewa Lumber and Boom Company. In 1925, Sweeny became tired of that hum drum life and migrated to Montana where he shortly secured employment as a Maintenance man for Wibaux County. In August, 1931 he went to work for the Highway Department at Wibaux, and was later transferred to Terry as Sectionman, which position he now holds. He is assisted by Gotthelf Ehman in Maintaining 37 miles of U.S. Number 10 west of Glendive. Sweeny is married and has two grown children, a boy and a girl.

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R. O. BROWN, (SI), Sectionman, Circle, Montana, Si was born in Dos Palos, California on January 21, 1902. At the tender age of two months Si's folks bundled him up and took out for Nebraska. After the growing up process was finished, Si went to work for the Chevrolet Garage in Harvard, Nebraska. In 1929 he moved to Circle and went to work making his fortune in Farming. In 1933 he had a change of heart and went to work for the Department as axman under the direct supervision of Hobo Mahon. While working in this capacity he helped build 246 C and 253 B. And as the sins of the Father is vested on the child, Si now is responsible for the upkeep of these projects. He is assisted by Owen (Red) Funk in maintaining 47 miles of Highway on Montana 13 and 18. Si is a widower with one son.

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GENE WHEELER, Sectionman, Sidney, Montana, Gene was born in Butler County, Kansas on August 21, 1885. In 1906, feeling the call of the wild, Gene migrated to Montana, settling in the Sidney Community on a homestead. In 1923 he went to work for the County as a maintenance man and continued with this until employed by the Department in 1933, maintaining the only State Highway in that vacinity. He is still sectionman working the 38 miles around Sidney, assisted by Henderson. If you ever want to find Gene, park any where on the streets of Sidney after quiting time. If you see a man at least a foot taller than the rest, thats Gene. He is married and the father of four grown children, three boys and a girl.

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JOHN HELE, Sectionman, Wibaux, Montana, John was born in Minot County, South Dakota, on September 25th, 1895. In 1907 John was brought to Wibaux

County, Montana by his Papa who took up a homestead and proceed to make a farmer out of him. This didn't set so good and in 1917 we find him in Washington trying to learn to run a buzz saw in a lumber mill. After a few lessons he mastered this art and stayed on the job until 1926, when he returned to Wibaux and went to work for the Standard Oil Company. In 1931 Johnny resigned this position and went to work for the Department. At present he is riding herd on 38 miles of State Highway around Wibaux. He is assisted by Happy Welliever in this undertaking. He is married and has three children, one boy and two girls.

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W. J. (BILL) KELLY, Janitor, Glendive Shop, Bill was born November 8, 1892, in Glendive, Montana. Lived with his folks on a ranch in the Cedar Creek section of country, south of Glendive, until he was big enough and tough enough to ride for other ranchers of the same section of country. From 1908 until 1918, Bill rode the range for several different stockmen in the vicinity of Glendive. Enlisted for the big fuss in 1918, and landed in France August 20, 1918. Went across with "C" Company, 40th. Division, 159th. Inf. Was transfered to "D" Company, 77th. Division, 307th. Infantry, (Noo Yoik's Own) Bill spent the winter in Sunny France and came back to the States in April, 1919. Worked at several different jobs in Montana, Washington and Canada until 1923, at which time he hired out to the Mountain States Tel. & Tel. Co. Worked for that company until 1931. He worked on highway construction during the remainder of 1931 and 1932. Started work for the Department April 25, 1933, on construction and transferred to the Maintenance Department April 16, 1938. He was appointed as janitor in the Glendive shop January 4, 1940. Bill is married and has six children. Four boys and two girls. This includes one set of twin boys.

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BERT ROGERS, Sectionman, Glendive, Montana, Bert was born at Sisserton, South Dakota, September 27, 1901. Moved, with his parents, to Duluth, Minnesota, at the age of 2 years. The family migrated to Montana in 1916, and took up a homestead near Wibaux, Montana. Bert worked for Wibaux County from 1918 to 1920. For the next five years he worked for several Construction companies, mainly the Western Construction Co., and Taggart Bros. & Tibbs. In 1925 he returned to Wibaux and was employed in a clothing store until 1929. On July 5, 1929, Bert started to work for the Highway Department and has been thus employed since. With sufficient help Bert manages to get around the 69 miles of highway in the immediate vicinity of Glendive. He is married and has two children. One girl and Little Butch.

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BURT ST. PETER, Sectionman, Savage, Montana, Burt was born in Kawance, Wisconsin, November 29, 1887. Burt was raised on a dairy farm near that town. At the age of 15 his parents moves to Washington, and Burt went along to grow up with the country. Burt's acts as a breadwinner consisted of working in a garage, dealing in automobiles, selling real estate and operating a gasoline service station. He worked for the Washington Highway Department for five years. Came to Montana in 1931 and started

working for the Highway Department in the Billings Division on the Irishers Holiday 1931. Transferred to the Glendive District March 16, 1933. Sent to Savage as sectionman and has been so employed since. He is married and has two daughters that are very easy to look at. Burt maintains 33 miles of highway on Montana #14 and is assisted by Clarence Scott.

Sectionmen aren't the only employees in the Glendive District either. We couldn't get along without Cecil Keebler, Jake Nadwornick, P. M. Pedersen, Bill Taylor, Le Roy Norgard, Ole Lervold, Jake Kelly, Bill Eiker, Erwin Atwood, Bugs Sundling and Carl Idland. These boys keep things in A-1 shape during the regular maintenance season.

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Old Gunga Din, according to someone, was a very pure guy who never would curse. His job was to see that the soldiers were watered, to bandage the sick or else call for the hearse.

That's all very well in a land that's all sunshine, and there isn't a mile of line to be run; where the ground is so soft that you don't need a frost pin, and the natives all dance and sing and have fun. But take the same man in a Montana blizzard, with a transit, a range-pole and chain in his care, with his fingers so numb that he can't light a smoke, and icicles hanging from his nose and his hair; with a contractor howling for blue tops behind him and the boss crying out for more line ahead -- if he don't start cussing the ground that he walks on, he's either not human, or else he is dead.

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A POEM BY A SATISFIED SECTIONMAN
(George Woods, Sectionman, Jordan)

Here's my piece for Center Line,
Gosh, I hope it's there on time,
I'm ambitious as the devil--so
Here's some news - it's on the level.

Jordan's just a little place,
Yet it's part of Division Eight.
I'll try to show you, in this part,
What kind of men we have at heart.

Murphy's Sampson of the crew,
Lordy, what that man can do.
As rip-rap man he's surely tops,
He starts to work and never stops.

Now Sullivan can work C. K.
But takes time out to have his say.
He bows to ladies passing by
Just to catch the public's eye.

"Handy" Lamphere's best in town,
When he's needed he's around.
That's all we have, except for me,
And I'm, well I'm, - oh, gosh, oh gee

This is where I came in,
And that's a bad place to begin,
So guess that I'll just say "adieu",
Boy, I bet you're glad I'm thru.

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EXCERPTS FROM A RIGHT OF WAY AGENT'S FILE

"Your solicitor left the map and papers. He said $100 was a fair price for the power line right of way across my property. I think so too, but I can pay only half of it now, the balance I will pay next month."

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WINTER BRIDGE CONSTRUCTION IN DIVISION EIGHT
By "THE HOBO ENGINEER"
(H. H. Mahon, Wibaux)

'Twas the morning of pouring the second big pier,
Not a man was seen idle (when the foreman was near),
The boiler was set by the mixer with care,
But in hopes that the weather that day would be fair.
The contractor nestled back home in his bed
While visions of estimates danced in his head.
The inspector in sheepskin and various coats
Had just checked the scales and returned with his notes,
When out on the works there arose such a clatter,
I sprang from my desk to see what was the matter --
Away to the window I flew like a flash,
But the frost had it covered from curtain to sash.
The sun was just rising and frost on the ground
Gave a luster of winter to objects around,
When what to my wondering eyes should appear
But a 40-mile gale with the dust blowing near.
While the foreman stood balanced on top of the form
And yelled at his crew with expressions quite warm,
As rapid as turtles the wheelbarrows came,
And he whistled and shouted and called them bad names,
"Hey, you on the sand there, you're holding us up,
"Now what the hell happened to that cement truck?
"Hey hurry it up gang!" he frantically wails,
"Hay Number two gravel, get up on those scales,"
And then in a twinkling I heard in the hopper
The first batch of concrete and it was a whopper.
As I drew in my head and was turning around ,
Down the ladder the foreman came with a bound.
He was dressed all in rags and I knew where he went,
For his clothes were all covered with dust and cement.
An old battered hat he had cocked on his bean,
As tough-looking a tramp as I ever had seen.
The wind how it blew and the dust how it swirled,
While the thistles and papers and tumbleweeds whirled.
A dirty gray cloud soon darkened the sky,
"More steam!" the inspectors were soon heard to cry.
The engineer sat with his pipe in his teeth,
And the smoke it encircled his head like a wreath.
There he sat on the bank he could watch all the work,
When the crane motor sputtered he turned with a jerk.
The wind it still blew and the rain blew on past,
And the concrete rose up in the forms quite fast.
The mixer mixed and the vibrator shook
And the engineer made notes in his book.
Late in the day when they got near the top,
The mixer would idle, the wheelbarrows stop.
"Two more", called the foreman from up on the pier
and the shovelers smiled that the end was so near.

(Continued)

The inspector counted the empty sacks,
And the crane operator was seen to relax.
As the foreman climbed down they all heard him say,
"Put your tools away fellows, that's all for today."
But we heard him exclaim ere he drove out of sight,
"HAPPY NEW YEAR! Inspectors, now don't get too tight!!"

.....

Over in the badlands of the Tongue River breaks
Where the hoot owls hoot and serenade the rattlesnakes,
Just across the coulee from the Funeral Rim
Lives a mighty desperate character called Yellowstone Slim.

When they see him coming all the grizzly bears run;
He has eighteen notches on the handle of his gun;
Eats the rawest, toughest beef that he can get
And washes down his grub with red hot panther sweat.

Born on a Friday near the Bitter Creek Forks,
To pack him to the home corral took thirteen storks;
The roughest, toughest hombre ever draw a breath --
A cross-eyed glance from him means instantaneous death.

Compared to him the man from Borneo is tame.
Oh, no! CH NO-O-O!! Not Ferdinand, but Sanders is the name.
When comin' down the highway like a hot shot freight
He's the rootin', tootin' ramrod of Division 8.

.....Selected and Anon.

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Then there's that story about one of Division Eight's prize rodmen (Located at Ekalaka)...He was returning from one of Miles City's hotspots out on U.S. 212 and he ran his car into the ditch. The weather being somewhat chilly (?) he left the car in the ditch, caught a ride into Miles and decided to return in the morning and get his auto. Very well, indeed, but the next morning upon returning to the scene, he found his auto there but the keys were missing. He walked over to a farmhouse nearby, knocked at the door, and inquired of the farmer if he knew anything about the missing keys. The farmer invited him in and then, with a gun in one hand and waving the keys in the other, the farmer said: "Pay me ten bucks or no keys!" We have heard that our S.I. friend finally settled for five bucks ... would have been cheaper to take the keys out, wouldn't it F. W.?

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SECTIONMAN'S LAMENT

Oil all patched, storage tanks dry
Weeds all burned, tools laid by,
Positively nothing to do but wait for the snow to fly.

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THE LO RANCH
By Jim Gookin,
Sectionman at Beaverslide Ranch, Division 8.

The only proof necessary to convince the most skeptical as to the standing of the LO Ranch is a short visit with any of the old timers who have known the Powder River Ranges since the time of the trail days and they will easily recall the "Lo Ranch on the Powder and Mizpah!"

It is quite difficult at this time to make any accurate statement of acreage that was used in connection with the operation of this vast holding, because of the fact that many acres of outside range were used in connection with the something over 100,000 acres of deeded land originally included in the ranch. There is, however, little doubt that at no time have the holdings dropped below 300,000 acres of fairly well controlled range of which a larger and larger acreage became deeded ownership.

As is the case with any fairly large business, the ownership and management of this ranch changed from time to time, but its major operative function was always the same, namely, the production of livestock - which stock included both sheep and cattle and of course the necessary horses to run and accommodate such a holding as this developed into as time went on.

The livestock numbers handled on the ranch varied with the years and the amount of so-called "free range" (that was used in connection) controlled in a large degree the number of head that could safely be run. With the outside range continually being cut down from homesteading and similar settlement, the holdings were cut down until in later years the livestock numbers did not exceed 5,000 head of cattle and upward to a little over 20,000 head of sheep. These numbers were being run as late as the 1930's and this inventory continued until the drought years of 1934 and 1936 at which time the livestock were liquidated and the holdings operated on a rental basis. This later change causing the reorganization of the company which was operating as the LO Cattle Company. Only two years later one of the principal stockholders of the reorganized cattle company died and with his passing the final decision was made to definitely and completely liquidate all of the interests and close out the entire ranch, which was done, and the liquidation of the 250,000 acres of deeded land was just completed last month (December 1939) when the last of the ranches was sold to some Wyoming livestock operators.

The main LO Ranch, however, is still being operated under that name by the new purchasers, the new owners being Ivins and Hardy of Nebraska and Wyoming respectively, and comprises one of the largest privately owned livestock ranches in the Northwest as it still consists of about 100,000 acres of deeded land and easily controls up to 50,000 acres more.

Other portions of the ranch have been sold to different ranch operators and without exception, the entire property has been taken up by practical, long-experienced ranchmen who are entirely familiar with the conditions they are being confronted with and there is no question but that the old Lo Ranch will continue to produce the fat cattle and sheep it did many years ago when J. M. Holt began the enterprise.

The other operators who have purchased portions of the ranch are C. W. Miles, formerly of Broadus, Montana, but now operator of the WL, Floyd Robinson, the new owner of the Cross S. Although a former Wyoming resident, he is now thoroughly "Montanaized" and a loyal and enthusiastic landowner and resident of the State. The Horkan Ranch, having been purchased by two other Wyoming men, Healy and Bonine of Worland, Wyoming, who expect to run both sheep and cattle on their holdings. The Beaverslide Ranch was purchased by the former LO Cattle Company ranch manager, Bruce Orcutt, who continues to make his home on this ranch which he has been operating for the past several years.

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Many of the articles which we have carried in Center Line have concerned trout fishing, of which Montana is quite proud. However, we have just read the following, which we are partially quoting, in the Dude Rancher, and it more than somewhat takes the wind out of our sails. We'll still keep touting Montana fishing, though.

"Supt. Thomas E. Whitcraft of the Grand Teton National Park recently verified reports of five and six-foot mackinaw trout in Moran Bay at Jackson Lake. First reported ten days ago, the stories of the monster trout estimated to weight between 70 and 100 pounds, were disregarded as "fish stories" until Supt. Whitcraft made a special trip to Jackson Lake with the most powerful glasses obtainable to check the reports.

"In an interview with a Jackson, Wyoming, Courier reporter recently, Supt. Whitcraft reported that seven members of the park staff have seen the mackinaws and studied their habits, with the aid of field glasses. "I myself saw only seven in the school, and with the glasses which brought them right close up, would say they will attain five feet in length."

"The park personnel has been scouring the country for tackle strong enough to hold the big ones and an expedition will take out sometime in the future in an effort to secure visible proof of the big fish.

"Allyn Hanks, chief ranger, was the first to report the fish and was scoffed at until other members of the park force were shown the proof. He reported thirteen in the school he saw and estimated some of them to be over six feet long.

"When it was suggested by a Courier reporter that perhaps the reported size was the result of an optical illusion created by magnification through the water, Supt. Whitcraft said there could be little doubt of their size as he was able to bring them close enough with the field glasses to see their markings. However, the park superintendent stated, 'We are not going to ask anyone to believe us until we catch one of them."

"The reports recall stories of a dead mackinaw found washed up on the south shore of Jackson Lake two years ago which measured sixty-three inches long."

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Not to change the subject, the Bureau of Fisheries (U.S. Department of the Interior) has estimated that sportsmen in the United States spent over $677,000,000 in 1938 for fishing licenses, tackle, photography, transportation, guides, food, lodging, bait and other necessities.

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# INSURING THE PROSPERITY OF GLENDIVE

By Fred Quinnell Jr.
Resident Engineer, Glendive

Any one dwelling in or around Glendive between the years of 1910 to 1929 will remember this locality as a vast agricultural region, studded throughout with prosperous farms and ranches. During the past ten years, due to the prolonged drought condition, which has been felt equally as well in other communities through out Montana, this once productive valley has rapidly become untenable as a farming center.

Through the efforts of the Mid Yellowstone Recovery Association, together with the untiring determination of the inhabitants of this vicinity, the Bureau of Reclamation was provided with funds to make an investigation of the valley to determine the feasibility of using the water from the Yellowstone River for irrigation of the land.

This investigation was completed in 1935 and it was found that approximately 56,000 acres were susceptible to irrigation. Three plans were submitted where by this might be accomplished. The first was gravity, the second pumping, and the third, a gravity and pumping plan combined. Although any of these plans would have taken care of the water need equally as well, it was found that the construction cost would be too high for the land to repay all of it. This discouraging outlook only tended to sharpen the determination of the community, and the problem was attacked with renewed vigor. Because of the urgent need for relief expenditures in this vicinity, the possibility of a direct grant to be expended for labor was tentatively studied. This grant was to be non-reimbursible and of sufficient proportion to make the balance of the construction costs low enough so that the land could pay it out. It was found that a direct grant of this size would be out ot proportion to the population effected, so another scheme was formulated whereby the acreage would be broken down into three smaller units for construction purposes, and an allotment, based on reimbursible and non-reimbursible funds, requested. This plan met with approval and the Glendive unit covering the land along the Yellowstone River between the Yellowstone River bridge at Fallon, Montana, and Glendive, Montana, was selected to be the first constructed. This section embraces approximately 18,000 acres of the original tract, and on August 26, 1937, the President allocated $1,605,000 of E.R.A. funds for construction purposes. These funds were ear-marked as follows: $829,000 to be a direct grant and to be expended for labor. $776,000 was to be expended for materials and Engineering and Administrative employees. The latter was to be reimbursed to the government through levies on the land profiting by the project. These figures were later revised to $1,057,000 non-reimbursible and $548,000 reimbursible funds.

Construction was started on the canal on November 12, 1937 and has progressed with few interruptions since that time.

The design of the system is based on a pumping requirement of one second foot for 55 acres of irrigable land, and on the delivery of a maximum of five second feet to the high points of every 80 acres tract as outlined by legal subdivision lines.

Construction of the system as specified in the allocation order of the President was carried on by government forces under the direction of the Bureau of Reclamation. All labor was obtained from W.P.A. rolls of the vicinity, with the exception of five to ten percent exemption for supervisory employees.

In addition to this the employment of equipment owned and operated on an owner-operator basis was allowed and paid for from the non-reimbursible fund. This plan proved very satisfactory and a great amount of benefit was derived by the inhabitants of this vicinity who were badly in need of financial aid.

The work was carried on somewhat as follows: An average of 55 four up teams and fresnos together with sufficient plow teams, were used on the canal and laterals. Approximately 868,000 cubic yards of excavation were moved in this manner. A fleet of owner-operation tractors and tumble bugs, and a Reclamation-owned 90 horse power tractor and ripper were also used on this part of the work. Their combined efforts moved around 250, 000 cubic yards. The remainder of the excavation around the structures and pump plant was moved with a 3/4 cubic yard drag line purchased by the Reclamation Bureau. To date around 1,550,000 cubic yards have been moved. The remainder, about 40,000 cubic yards, will be moved with the drag line.

The water will be pumped by the plant constructed near the present bridge site of the Yellowstone river bridge at Fallon, Montana, into approximately 31 miles of canal. This canal is constructed at the intake and with a base width of thirteen feet, a depth of seven feet, and a free board of three feet. It has a capacity of 330 cubic feet per second. The size of the canal gradually decreases at the syphon sites until at the lower end, the base width is four feet, water depth, two and six tenths feet, and a free board of one and four tenths feet. The capacity at the lower end is thirty one cubic feet per second. The total drop of the water surface from the beginning to the end is thirty four and two tenths feet. One and a half to one slopes are used through out on the canal construction.

The pump plant serving this unit is designed to deliver 330 second feet of water against a dynamic head of one hundred three feet. It has provisions for the installation of three separate pumping units, each capable of delivering one hundred ten cubic feet of water per second. Two of these units are at present powered with 1,500 horse synchronous type motors. These two units were tested during September and October, and were found not to be capable of delivering the required amount of water. As a result the contractor is now making alterations which will require new pumps to be installed and tested before the 1940 irrigation season starts. Power is supplied to the pump motors from the 33,000 volt line owned by the Montana-Dakota Power Company. Due to the motors only using 2,300 volts for their operation, transformers have been installed by the Bureau.

Structures along the canal consist of 10 concrete syphons, having a combined length of 4215 feet, 4 waste ways, 5 creosoted timber bridges across U.S. #10, 25 county road and farm bridges, 27 culverts under the canal, 28 concrete pipes under U.S. #10, 43 main canal turn outs, 8 lateral turn outs, 149 farm turn outs, 126 drops, of both the check and weir types, and 55 checks.

The remaining work necessary for the completion of this unti consists of general cleaning up over the entire system, moving approximately 40, 000 cubic yards of excavation, and priming and puddling the canal banks. Barring unforseen difficulties, such as the requirements of canal linings and additional rip rap, the system will be ready for delivery of water over its entire length by the beginning of the 1940 irrigation season, and again, the Eastern End will become the aggressive, financially independent vicinity that is its right.

.....

WRONG NUMBER???

After a lengthy and detailed five-minute description of telephonic instructions of how to get to his home, Hi Holt wound his explanation up thus: (Note - Margaret is Hi's wife).

"Well, if you can't find the house, just call her up -- but then maybe you'd better not -- she might be upstairs and if she is she won't hear the phone and won't answer, but you try anyway, and if you can't get her by phone, go down through the subway and turn to the right past the Lutheran Church, you know where that is? Well, it's the one with the little porch on it -- yeah, that's right -- then go straight down Montana Avenue -- no, I think it's Twelfth Street, for three blocks and on the right there's a red brick house. What? Yes, that's right -- no, that isn't the one, it's the one across the street next to the gray stucco one. That's right, uh huh -- nope, you can't miss it.

"O. K., goo'bye .. oh, hey, say wait a minute -- I just remembered, Maragret said she was going uptown to have her hair fixed and I have to get a can of soup on the way home for lunch so I don't know when she'll be home so you'd better not go over there. And ... what? Number please? Say, what the hell, Operator? Operator! Operator! Can yuh beat that? Ain't that just like an in-law? She hung up on me!!"

.....

'JEVER KNOW ?

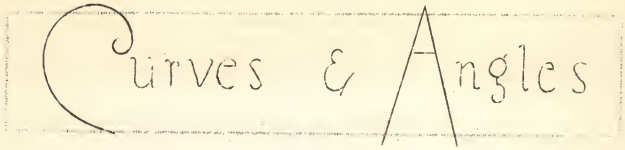
'Jever Know --

That Division 8 is the biggest in the state?
That we're located on Hooker's Spur?
That we don't mind our location and route?
Because if we weren't here and if it weren't for us,
Middleton wouldn't have had nothing to write about?

.....

Everyone knows the girl they call "Flashlight" because she's Ever Ready .....

.....




Elizabeth Baldwin made a good showing in the recent ski tournament between Helena and Bozeman.

+

Mary Morris is spending a few days visiting friends and relatives at Baker. And have you heard the rumor floating around about Mary and "Slick"?.

+

What's this we hear about Edith Devlin's car hitting a horse in California a short time ago? We've seen the damage done to the car, and, being a great admirer of horses, we are quite concerned about what happened to the animal.

+

The horse and mule live 30 years
And nothing knows of wines and beers;

The goat and sheep at 20 die
And never taste of Scotch and rye;

The cows drink water by the ton
And at 18 are mostly done;

The dog at 15 cashes in
Without the aid of rum and gin;

The cat in milk and water soaks
And then in 12 short years it croaks.

The modest, sober, gone-dry hen
Lays eggs for nogs, then dies at ten;

ALL ANIMALS are strictly dry
They sinless live and swiftly die.

But sinful, sinful, rum-soaked MEN
Survive for three score years and ten!

+

Don Gough and Martin Clark (ladies page scoop) have very recently assumed the burden of fatherhood. It is somewhat of an old story to Don as he now has two little sons, but it is a new experience for "Cookie" who is very proud of his new daughter.

+

Sally Byrd, of the Planning Survey, submitted to an appendectomy January 5. She is now convalescing at home and we hope she will soon be able to return to work.

+

Kathryn and Clarence Ratchye dropped in on the Planning Survey not long ago. They were both formerly employed in that office, but since their marriage have been located at Havre. Judging from appearances, Clarence must think that Kathryn's cooking is much better than that restaurant food.

+

Frances Durfee, also of the Planning Survey, recently spent a week-end in Spokane, visiting her sister.

+

A girl may wear a golf outfit when she can't play golf, a ski outfit when she can't she, a bathing suit when she can't swim, but when she puts on a wedding gown, she means business. (Intercepted from SIDE SWIPES).

+

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The Sunday Missoulian has recently printed a 48-page rotogravure supplement, containing 127 photos of superb scenery. Several pictures reproduced in the edition were taken by Herb Kuphal of the Missoula Division, and very nice they are. Included in this collection of photographic subjects are the scenic wonders of Glacier National Park and the world-famous Going-to-the-Sun Highway over Logan Pass; beautiful Flathead Lake, one of the largest fresh water lakes in the United States; Kerr Dam; the majestic Mission Range; and the many lakes, streams, snow-capped peaks and scenic spots in "Vacation Land -- Western Montana". The book is entirely scenic and contains no commercial advertising. All in all, it is one of the best things of its kind we have ever seen.

The Missoulian will mail copies, including your name on the envelope, anywhere in the United States for 15¢ per copy. If you've been trying to entice some eastern friend out here for a visit, we believe this will help do the trick.

.....

A cocktail is a pleasant drink, some people say, but I don't think. When you finish one, you ask for two, then you don't know what you do. Last night I hoisted twenty-three of these arrangements into me; My wealth increased, I swelled with pride; I was pickled, primed and ossified. At twelve last night I felt immense -- today I feel like thirty cents. If ever I should take the pledge, I'd take it right afer an edge, For there is no time for mirth or laughter in the cold gray dawn of the morning after.

(Note: Fred Quinnell submitted this one shortly after New Year's Eve -- power of suggestion, maybe).

+

A little vamp, a low-turned lamp, a heart filled high with hope,
A whisp of hair, a shoulder bare, all this is deadly dope.

A booted Paw, a night-gowned Maw, a muffled cry a choke,
A sudden jar, a shooting star, all this is deadlier dope.

+

Texas Highway Sign: "This is God's country. Don't drive like hell."
Traffic Sign in Pennsylvania village: "Slow. No hospital."

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# SIDE SWIPES

## BY PSYNUS

The secret of success in conversation is to be able to disagree without being disagreeable.

+

Educator John Dewey, now 80, admits certain disillusionments -- in the effectiveness of schooling (Germany is the world's most literate nation); disillusionment in Thomas Jefferson's faith in the corrective value of a free press (a politically free press may still not be free); disillusionment in Marxism (pretending to be scientific, it has become "thorcly anti-scientific", an inflexible dogma); disillusionment in war (a supporter of the first war to "save democracy" Dr. Dewey now says: "Resort to military force is a first sure sign that we are giving up the struggle for the democratic way of life."

+

The narrower the mind the broader the statement. -- Ted Cook.

+

"Everywhere there is a class of men who cling with fondness to whatever is ancient, and who, even when convinced by overpowering reason that innovation would be beneficial, consent to it with many misgivings and forebodings. We find also everywhere another class of men, sanguine in hope, bold in speculation, always pressing forward, quick to discern the imperfections of whatever exists, disposed to think lightly of the risks and inconveniences which attend improvements. In the sentiments of both classes there is something to approve. But of both the best specimens will be found not far from the common frontier. The extreme section of one class consists of bigoted dotards -- the extreme section of the other consists of shallow and reckless empirics." -- Lord Macauly, 1841.

+

According to Dr. Josephine Rathbone: Most afflicted by tension are patriots, close students of world affairs, Sunday drivers, business men, energetic and ambitious people generally.

Moderately religious people are more relaxed than unbelievers or religious fanatics.

Tense individuals should lie down and relax for five minutes at frequent intervals.

To relieve insomnia, go to be an hour earlier than usual for two weeks; obliterate worries with pleasant thts of childhood.

+

Councilman Stanley, who operates a grocery in Muncie, Indiana, raised a moral issue recently. His wife had their twin sons downtown and the boys saw a nude model in a store window, standing deshabille pending a shift of scenery. "Mommy," said one of the boys, "if the lady wants to take a bath why doesn't she go to a bathroom?" Horrified, Mrs. Stanley rushed them home. And horrified Councilman Stanley rushed to the Council Chamber. He demanded an ordinance prescribing a screen between the public and the callous window dressers.

+

This theatrical season Polonius wears spectacles, a detail which caused a great to-do among anachronism-chasers until they ascertained that glasses were worn in Shakespeare's day. Nobody seemed to care whether they were worn in Hamlet's.

+

When the Pot O' Gold winner does not answer the phone he gets $100 and the remaining $900 swells the pot for the succeeding week. Now that the chain movie houses double the pot of the winner is in one of their show palaces, the Lab math-wizards are figuring what would happen if everyone called for several weeks should be at the movies.

+

"Men! Are you skinny, tired, nervous, run-down? Try a bottle of sarsaparilla and watch those muscles grow." That is the sort of thing famed Hormone-maker Russel E. Marker of Penn State expected to see splashed all over the papers last week. He had just told chemists about his new, cheap, artificial production of three powerful sex hormones from sarsaparilla root compounds. "Caution: Please do not assume that the hormones are derived from a bottle of soda pop."

+

Houses that rent for $2.50 a week have been built in Fort Wayne, Indiana. These houses are prefabricated by WPA laborers from phenol-resin plywood panels filled with rock-wool batting insulation. The wall sections are 4 inches thick and are set on a 4 inch concrete slab poured on gravel. The sections are put together with steel tie-rods and have been erected in 1 hour 40 minutes. Including windows bought as finished products, the total cost of materials is $460 for a three-room & bath domicile.

+

Most obvious advantages of film records over wax records: No surface noise or record wear. Simplification of storage problems. Whole symphonies and opera can be played without stopping to flip a record or change a needle.

As in cinema recording, music films can be cut and patched, their wrong notes erased, their sour ones replaced.

Unlike phonograph discs, they can even be played backwards, which is said to improve some modern compositions.

+

The scientific achievement most important to Germany in World War I was only indirectly a military weapon, and has since been used far more in peace than in war. This was Fritz Haber's nitrogen-fixation process which enabled Germany to manufacture nitrate for explosives and other nitrogen compounds from thin air. Haber's name has been smirched in Nazi Germany. He was a Jew.

+

In Pittsburgh, asthmatic Eugene Roehm, under an oxygen tent, lit a cigaret, flared up like a match, burned to death.

+

A New York detective agency that specialized in tracing missing persons has been employed by more than 70,000 wives to find their husbands, but by only 15 husbands to find their wives.

+

"Gadsby" is a 50,110 word novel in which no 'e's' occur. Ernest Vincent Wright worked on it for five and one-half months, tieing down the "e" bar of his typewriter. He wrote it to prove that "e", altho commonly used five times more than any other letter, is not indispensable.

+

Recently when the President of France "secretly" visited the front he saw across the river on the German bank a banner with letters ten feet high, reading "Bienvenu (Welcome) M. le President!"

+

A few years ago Drs. Freeman and Wood decided to test a theory that the typewriter would help children to learn. Four leading manufacturers agreed to furnish the money and to lend 2100 portable typewriters which were distributed to 30 schools in eight widely separated cities. In each city, some schools were selected as experimental schools where typewriters were used and some as control schools where they were not used. 14,000 children from five to twelve participated in the two year experiment which has led to this interesting educational discovery -- old-fashioned methods of teaching your child to write longhand first are unnecessary and may actually retard his rate of school achievement.

+

To help Pennsylvania farmers dispose of an egg surplus, slot machines dispensing hard-boiled eggs for a nickel have been installed in bar and tap-rooms.

+

An optimist is a man who knows things can be worse but doesn't believe it is possible.

+

The modern deck of playing cards dates back to Queen Elizabeth's day--the four kings pictured are David, Alexander, Caesar and Charlemagne.

+

Talking-letter slot machines are in use in some German and Netherland post-offices. The person speaks into a microphone -- a moment or two later the recording drops out neatly wrapped and ready to be stamped for mailing. The recordings are made on light weight plastic discs resembling cellophane, and can be folded. Two records lasting ten minutes each can be mailed for 3¢.

+

"The idea that every 20 years this country should feel called upon to save a continent that cannot run itself seems to many a nightmare and sheer madness." ....Prime Minister of Canada, Mackenzie King, March 30, 1939.

+

The Memophone is a mechanism (not a slot machine) which works independently of the ordinary telephone dial. On top of a small box is an indicator table with room for 30 names. To call a number you move the indicator oppsite the name you want, press a lever and the works inside the box then do the dialing in about 7-1/2 seconds, as compared to about 15 seconds for hand dialing. By locating police and fire calls at the top and bottom of the indicator's range these numbers can be called in darkness. It was found that approximately 16⅔ of hand-dialed calls were wrong numbers.

+

"Keep tabs, break even, play both ends against the middle, call the turn, heel (derogatory), in hock, lose out, win out, piker, square deal, stool pigeon, string along, shipsawed, on velvet, start on a shoestring". The above expressions came into the language from the single game of Faro, long the nation's favoite gambling game, according to Herbert Asbury in his history of American gambling, "Sucker's Progress".

+

"Popular Readers" and "Regulation Shiners" are not grade school literature and an optical discoloration, in the parlance of the crooked gambler, but marked cards and ring mirrors.

+

The Scotsman's prayer: "God grant I may be right -- for ye ken I never change."

+

As life is made more secure, psychologists claim people will gamble even more than now. Gambling would provide a thrilling risk that their workaday lives would not provide.

+

Latest of the American Guide Series compiled by the Federal Writers' Project corrects the following fallacies about Alaska:

That Alaska is a frigid land -- at Fairbanks it is sometimes 100 degrees in the shade.

That Eskimos live in ice houses. In Alaska an igloo is a house of earth and wood.

That Alaska is remote from civilization. It is only a few hours flying time from Yokohama or Manhattan.

That the Klondike is in Alaska. It is in Canada.

+

Fearing a Democratic victory in Philadelphia might remove Councilman Pommer from his post, newsmen set about collecting his legendary sayings:

"A lot of water has flowed under the dam since then."

"We ought to set down and have a house-to-house talk."

"I will reserve the right to criticize anything I think is right."

"Where'd they get the money, why, right out of the rabbit's hat."

"If I was to tell you that, you'd drop right outa your pants."

"We went to see Snow-White and the Seven Drafts."

"It all depends on where the shoe is going, and what pot's being filled."

When the returns were in, Pommer was back for his 42nd year. Keystone of his winning campaign was his philosophy: "I have always been man enough to stand on my own two shoulders."

+

When I was very young I was disgracefully intolerant, but when I passed the thirty mark I prided myself on having learned the beautiful lesson that all things were good, and equally good. That, however was really laziness. Now, thank goodness, I've sorted out what matters and what doesn't. And I'm beginning to be intolerant again. ...G. B. Stern.

+

RATTLE SNAKE TRAILS AND TRAITS
By M. R. Wickman, Bridge Project Engineer
Division 8 - Ekalaka

Has any person followed a rattle snake trail? Well, I have. The snakes leave their dens to give room for golfers (sometimes), and sun themselves on top of rocky ledges, to keep from drowning in the low lands. They seem to enjoy the quiet of the high altitude ridges, because there are few people with enough ambition to disturb them there.

If one should inadvertently stumble upon one of these venomous reptiles, and disturb his apparently harmless siesta, he would immediately coil. His tail would commence a violent vibration, from which issues a dry reedy rattle to foretell the dire danger to trespassers. However, the very fact that the snake must coil before striking gives an alert person a jumping chance. His striking distance is only three fourths his length. Of course, one would not become mathematically inclined at such a time and endeavor to gage a safe range of distance from this fearsome creature. My advice therefore, is to look, and immediately leap. Leap far! Many unofficial hurdle records have been made by members of an engineering party, due to their predominating instinct for self-preservation at such a time.

Mother Nature has endowed Sir Rattle Snake with a wiliness, which his candid rattle seems to belie. When he is entering a hole, which is hardly more than the circumference of his body, one would think he would be at a disadvantage for a rear defense. However, this is not true. The snake continues to double back, keeping his head just under cover inside the entrance of the hole, until he has entirely entered this shelter. If one were to grab him by his nether extremity at such a time it would be fool-hardy and fatal to the would-be captor.

The rattle snake has fangs which resemble two pointed teeth. When his jaws are closed these fangs lie back on the roof of the mouth. Upon striking, the fangs automatically extend with the opening of the jaws and attach themselves to the object in range. The poison sack is immediately behind the fangs in the roof of the mouth. The venom flows through perforations in the fangs to the tips, which are serrated to inject the poison more surely in the victim.

I went into detail concerning the biological make-up of the snake's mouth, with a definite purpose in view. At one time I had an ulterior motive, besides nature study, in regard to the phenomenon of the snake's method of protection. I tried to commercialize on the snake venom, which is used in various serums. In order to secure this venom, one must go through a procedure called "milking" the snake. My system was to place a forked stick directly in back of the snake's head and hold it fast to the ground. I then grabbed the snake around the neck with my left hand and squeezed the jaw hinges, automatically opening the mouth and protruding the fangs. I placed a small tube over the fangs and tried to force the venom thru the fangs and into the tube by pressing on the poison sack.----It didn't work. The great financial prospects in this field left me quite stricken with the results of my experiment.

I must be consistent now, and go back to the snake trails I mentioned in my opening paragraphs. You may see rattle snake trails anywhere along the prairies or hills. Some see actual rattlers Saturday nights. The venom of these snakes seems to emanate from brightly labeled bottles or graceful jugs, instead of formidable sacks and fangs. This Saturday night venom leaves a toxic tomorrow, but is seldom fatal. It is accompanied by a merry rattling of ice in the bottom of a cocktail glass. Personally, I prefer the latter.

.....

MEMORANTUM: Subject: Division 7 Cover on "Center Line".

TO: Alec Middleton

FROM: Questioning Cuties in Division 8

Your issue of "Center Line" was commendable, indeed,
And Oh!! so interesting and enjoyable to read,
And we're sure you'll appreciate, for the rest of your days,
Our inspiring influence as an aid to praise.
So we think we're entitled to question or criticize
Your cover as seen from our critical eyes...
Equipment time out should be 1/1/40; equipment time in 12/31/49.

Now the fellahs all think that their argument is right
(Personally I think they just wanna fight)
And suggest that the checker of your equipment slips
Be put on the carpet and subjected to whips.
So jump on the operator and give him hell,
He oughta know he's not doing so well.
And if we're wrong, we'll apologize,
Won'tcha let us know and please advise?

.....

ERRATA

(Materials Laboratory Progress Report, Part Two, of the December Issue)

Page 16, first line of paragraph one, for "Hydrophilis" read "Hydrophilic".

Page 19, first paragraph, third line, for "over-curing" read "oven-curing". Next to last line, for "os" read "so".

Page 20, last paragraph, first line, for "hygroseopic" read "hygroscopic". Second line, for "hydrophylic" read "hydrophilic". Last sentence, for "hydronholic" read "hydrophobic". Next to the last sentence, for "so this humidity of the air becomes less", read "as the humidity of the air becomes less".

+

Part Three of the above report follows on the next page, and will be continued in later issues.

+

MATERIALS LABORATORY PROGRESS REPORT
ON
AN INVESTIGATION OF THE ADHESIVITY OF
BITUMINOUS MATERIALS TO LOCALLY AVAILABLE AGGREGATES
IN THE PRESENCE OF MOISTURE

PART THREE

For the purpose of evaluating the effectiveness of the water-asphalt and swell tests in determining the adhesivity of oil for an aggregate, charts were plotted using the swell test results as the abscissa and the water-asphalt results as the ordinate. In Chart I, the results of tests run on the natural aggregate from 221 samples from various sections of the state are plotted. The points plotted in green are those in which the strips were from fair to very good, and the points plotted in red are those in which the strips range from poor/fair to very poor. Section 1 of this chart designates those that are within the desirable limits for the water-asphalt and swell. 44.7% within these limits show good strips, while 55.3% are poor. Section 2 shows the results that pass the swell test but fail on the water-asphalt test. 28.2% of these were good strips, while 71.8% were poor. Section 3 contains the results which were outside of desirable limits in both swell and water-asphalt, and were 100% failures on the strip test. Section 4 contains the results passing the water-asphalt but failing in the swell test, and were 100% poor in the strip test.

With strip failures dominating every section of the chart, including the one within desirable limits, it can be seen that the swell and water-asphalt tests cannot be used as a definite criterion in determining the adhesivity of an aggregate-oil system. The variable factors entering into the two tests may explain the discrepancies. The water-asphalt test, in the first place, deals with the -200 mesh material exclusively, and fines from various pits differ greatly in both their physical and chemical properties. Where the fines are the product of deposition caused by poor drainage they differ in particle size, % water solubles, and chemical nature, from the fines in a pit with good drainage from which the clays, water solubles, etc. are carried away. However, the coarser fractions in an oil mix may contain adsorbed activating ions which causes an adherence between the oil and aggregate surface which moisture will not break, even though the fines from the mix failed in the water-asphalt test. This accounts for the difference between the results of the water-asphalt and the swell and strip run on the aggregate as a whole.

In the case of those aggregates plotted in Chart I, whose fines show a low water-asphalt result but whose strip is poor, the reverse of the above is true. That is, no adsorbed activating ions were present to cause any degree of adhesivity.

A fraction of the minus 200 material can be just poor enough or good enough to give a water asphalt preferential result that will contradict the strip test result, which is a measure of the aggregate as a whole. As stated in part one of these reports, the varying factors which cause an aggregate to be hydrophilic or hydrophobic, will explain the many combinations of good and poor results encountered in the strip, swell, and water asphalt preferential tests on different aggregates from the field.

The swell test was designed to give definite information on the degree of swelling of a bituminous mat when subjected to adverse moisture conditions. But here, as in the water-asphalt test, we find that the type of filler material has definite bearing upon the results. Fines which increase the density of the mat, (fine, floury material which fills the voids) do not allow full penetration of the moisture. Thus, comparative results between different mats would be impossible where one's swell depends upon only 10% of its thickness, while the other is completely saturated.

Swell briquettes, some saturated, some partially penetrated, and one not subjected to water at all, were broken and oven-dried, and the percent moisture in the mold proper determined in each case. The results were as follows:

| | |
|---|---|
| Saturated briquette (Crushed) | 4.78% moisture |
| Partially penetrated (Natural) | |
| 1. | 0.59% " |
| 2. | 0.52% " |
| Briquette not wetted (Natural) | 0.40% " |

These figures show that any oil mix may contain some moisture, and that the type of filler material has a definite, direct bearing on the results. In the natural aggregate briquettes, 1 and 2, the portion of the briquettes into which the moisture had penetrated was approximately 1/2 inch deep. The results were rather high but still within our specifications. If these mats were thoroughly wetted, a correspondingly higher swell would have resulted and it is possible that they would have failed. These mats, if laid in the field would be subjected not only to surface moisture but also to subgrade moisture, producing a double swell effect not experienced by the laboratory briquettes.

The filler material in the two natural briquettes was naturally disintegrated, fine and floury, with expanding properties, and as such, expanded when wet, sealed the voids and allowed only a partial penetration into the mold.

The briquette made of crushed material, however, contained fines crushed from the parent rock. These fines had no expanding properties, and although passing the 200 mesh sieve, were not as fine as natural filler material. This allowed complete penetration of the moisture, but showed no high swell.

Comparison of the Charts I and II shows the tendencies which the above briquettes exhibited. Chart I plots results of water-asphalt, swell and strip tests using natural aggregate, while Chart II plots these test results on crushed aggregate. The crushed aggregates show practically 100% passing the swell test, regardless of water-asphalt or strip results, with a large percentage being grouped into the very low swell bracket. The natural aggregates, however, are not concentrated into any one swell grouping, but vary over the entire range up to those with extremely high swells. The high swell results are on those briquettes of natural aggregate, into which the moisture was able to fully penetrate, and thus allow the swelling of the complete briquette.

In order to compare our laboratory results with regards to strip test, with probable behavior in the field, we took advantage of the field oil mix samples sent in for the extraction test to run strips.

Table I shows the strip results on 168 of such samples, and their comparisons with the original laboratory results on pit samples from the same project. The figures show a parallel of results with each other. In the cases where the laboratory strip test on the original proposed surfacing sample was good, the field oil mix tested good to very good. In those cases where laboratory results were fair, the field strip tests show fair to very good. And in the cases where the majority of laboratory strip tests failed, or showed poor, field mix samples showed poor also.

The field mix samples show a tendency in this chart to be better, in the case of those aggregates which showed a fair to good strip, than the laboratory test results. This can be explained by 1) the time element, since the field mix samples had curing periods varying from several days to several weeks, whereas the laboratory tests were conducted after a 24 hour curing period, 2) the use of different asphaltic material in the field from the SC-3 oil used for routine strip tests in the laboratory, and 3) the field samples generally show a smaller percentage of fines than the laboratory samples. In the case of those samples showing poor strips, however, no improvement was noted. In other words, most hydrophilic aggregates are not materially improved by such means as length of curing periods, use of different grade oils in the mix, etc. Also, data compiled from the extraction tests shows that the percent oil used in the mix, even definite over oiling, has no beneficial effect upon increasing the adhesivity of a hydrophilic aggregate.

Several engineers have asked why an oil mat seems to stand up well even though the strip test was very poor. The strip test procedure itself explains this because it is a test to show behavior while the mix is subjected to adverse moisture conditions. It is true that where a mix is laid down on subgrade with ideal drainage conditions or where the moisture problem is negligible,a mat made of hydrophilic aggregate may give good service.

Comparison of the gradings of the field oil mix samples with the percent fractions used in laboratory test samples show that the grading of an aggregate to be used for oil mixes has little to do with the adhesivity, and that the nature of the aggregate surface is the determining factor. Table II shows considerable variance in the grading in the mixes, as compared to the uniform grading used in the laboratory, while Table I shows the close parallel of strip results, regardless of the variances in grading. In connection with the grading of oil mixes, data from top course surfacing samples taken immediately prior to oiling and on the oil mix extraction samples from the same project, showed that road mix operations change the grading in the final mix. The coarser fractions are partly crushed to finer material, varying from 2 to 12%, thereby increasing the percent of the finer fractions. However, the data available showed that the resultant percent of the various fractions were not changed sufficiently to fall outside of our specifications, but rather tended more to the actual mean of our specifications. In several instances, the original uncoiled aggregate fell slightly below our minimum specification on some fractions of the mix, but after the grinding action of the blades while oiling, were brought within the maximum and minimum limits. This same action, with its resultant pressure, coupled with the rolling action involved, explains the fact that good mixes are obtained using a comparatively cold aggregate while mixing with the oil.

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TABLE I

CORRELATION BETWEEN ORIGINAL P.S. LABORATORY RESULTS AND FIELD OIL MIX SAMPLE RESULTS

| LABORATORY P.S. RESULTS | | | | | | FIELD OIL MIX RESULTS | | | |
|---|---|---|---|---|---|---|---|---|---|
| Proj. No. | Lab.No. | Grade Oil | Swell | WAP | Strip | Lab.No. | %Oil | Grade Oil | Strip |
| | | | | | | 47906 | 5.20 | I-SC-3 | Very Good |
| | | | | | | 47907 | 4.96 | " | Good |
| 250 A3 | 44995 | SC-3 | 0.0094 | 2 | Good | 47908 | 5.45 | " | Very Good |
| | " | MC-2 | 0.0025 | 1 | Good | 47909 | 4.92 | " | Very Good |
| | | | | | | 47910 | 4.19 | " | Good |
| | | | | | | 47911 | 4.50 | " | Good |
| | | | | | | 47955 | 3.54 | I-SC-3 | Fair-Good |
| | | | | | | 47956 | 5.73 | " | Fair-Good |
| | | | | | | 47957 | 5.27 | " | Fair-Good |
| | | | | | | 47958 | 5.19 | " | Fair-Good |
| 250 A3 | 46147 | SC-2 | 0.0075 | 5-N 4-Fl | Good | 47959 | 4.37 | " | Fair |
| | | | | | | 47960 | 7.03 | " | Fair-Good |
| | | | | | | 47961 | 6.28 | " | Fair-Good |
| | | | | | | 47962 | 5.68 | " | Poor-Good |
| | | | | | | 47995 | 4.09 | I-SC-3 | Fair-Good |
| | | | | | | 47996 | 4.36 | " | Good |
| | | | | | | 47997 | 4.37 | " | Good |
| 250 B2 | 46365 | SC-2 | 0.0043 | 0-N 9-Fl | Fair | 47998 | 4.37 | " | Fair-Good |
| | | | | | | 48103 | 3.18 | " | Good |
| | | | | | | 48104 | 3.42 | " | Good |
| | | | | | | 48105 | 4.37 | " | Good |
| | | | | | | 48106 | 3.64 | " | Very Good |
| | | | | | | 48107 | 3.82 | " | Very Good |
| | | | | | | 48102 | 5.57 | " | Very Good |
| | | | | | | 48151 | 4.19 | " | Good |
| | | | | | | 48152 | 4.87 | " | Very Good |
| | | | | | | 48153 | 4.07 | " | Very Good |
| 250-D3 | 46365 | SC-2 | 0.0043 | 0-N 9-Fl | Fair | 48154 | 3.74 | " | Very Good |
| | | | | | | 48155 | 4.24 | " | Very Good |
| | | | | | | 48156 | 5.19 | " | Very Good |

TABLE I (Sheet 2) LABORATORY P.S. RESULTS FIELD OIL MIX RESULTS

| Proj.No. | Lab. No. | Grade Oil | Swell | WAP | Strip | Lab.No. | %Oil | GradeOil | Strip |
|---|---|---|---|---|---|---|---|---|---|
| 24 MA-11 | | (SC-2 | 0.0073 | | Good | 48389 | 4.37 | Y-SC-3 | Good |
| | 46426 | (MC-3 | 0.0131 | | " | 48390 | 5.36 | H-SC-3 | Good |
| | | ( 85+ | 0.0152 | | " | 48391 | 4.37 | " | Good |
| | | (SC-2 | 0.0046 | | Fair | 48392 | 3.68 | " | -(F -Fair |
| | 46430 | (MC-2 | 0.0028 | | Good | 48393 | 4.28 | " | (C-Good |
| | | ( 85+ | 0.0029 | | Good | 48394 | 4.00 | " | -Fair |
| | 46899 | SC-3 | 0.0032 | 27-N 39-Bl | Good | | | | -Fair |
| 32 MB-12 | | | | N-2% | N-Good | | | | |
| | 48329 | SC-3 | | M-53% | M-Poor | 48395 | 4.78 | Y-SC-3 | Very Go |
| | 48486 | " | n 0.0037 | N-10% | N-V.Good | 48396 | 4.56 | " | Fair |
| | | | M 0.0055 | M-38% | M-Fair | 48397 | 6.10 | " | Good |
| 92 U-3 | 44951 | SC-3 | 0.0037 | 4%M 3%Bl | | 47878 | 4.78 | | F-Fair G-Good |
| 131-A-2 | 44951 | SC-3 | 0.0037 | 4%N 3%Bl | | 47875 | 5.27 | Y-MC-2 | F-Fair to Poor G-Good |
| 243-D | 47583 | Y-SC-3 | N 0.0075 | 33%N | N-Poor | | | | |
| | | | M 0.0095 | 28%M | M-Fair | | | | |
| | 47584 | " | N 0.0151 | 36N | N-Poor | | | | C-Good |
| | | | M 0.0071 | 27M | M-Good | 48169 | 6.20 | H-SC-4 | F-Poor |
| | 47585 | " | N 0.0103 | 27N | N-Fair | | | | |
| | | | M 0.0087 | 30M | M-V.Good | 48398 | 5.50 | " | Fair |
| | 47624 | " | N 0.0190 | 26N | N-V.Good | | | | |
| | | | M 0.0039 | 26M | M-V.Good | | | | |
| | 47625 | | N 0.0267 | 38N | N-Poor | | | | |
| | | | M 0.0093 | 33M | M-Good | | | | |
| 330-B2 | | | | | | 47913 | 4.37 | I. SC-3 | Good |
| | | | | | | 47914 | 4.10 | " | F-Fair |
| | 45804 | SC-2 | 0.0078 | 13N 34Bl. | Good | | | | C-Good |
| | | | | | | 47915 | 5.01 | " | Good |
| | | | | | | 47916 | 5.01 | " | F-Fairto Goo |
| 332-D1 | 45983 | SC-3 | 0.0294 | 15N 35Bl | Fair | | | | |
| | 46076 | " | 0.0265 | 1M 9Bl | Poor | 48490 | 4.08 | Y-SC-4 | Poor |
| | 46077 | SC-3 | 0.0287 | 0.5N 22Bl | Poor | 46491 | 4.00 | " | Poor |
| | 46078 | " | 0.0160 | 10N 0Bl | Poor | 48531 | 3.83 | " | Poor |
| | 47337 | SC-2 | 0.0116 | 11N | Poor | | | | |
| | | SC-3 | 0.0125 | 36Bl | Poor | | | | |

CORRELATION BETWEEN ORIGINAL P.S.
RESULTS AND FIELD OIL MIX SAMPLES

TABLE I (Sheet 3)

| | LABORATORY P.S. RESULTS | | | | | FIELD MIX RESULTS | | | |
|---|---|---|---|---|---|---|---|---|---|
| Proj.No. | Lab.No. | Grade Oil | Swell | WAP | Strip | Lab.No. | %Oil | Grade Oil | Strip |
| | | | | | | 52115 | | Y-SC-4 | V.Poor |
| 241 C2 | 52067 | SC-3 | 0.0095 | 2 | Poor/Good | 52116 | | " | V.Poor |
| | | | 0.0117 | 42 | Poor | 52534 | | " | Poor/Fa |
| | | | | | | 52535 | | " | Poor/Fa |
| | 51123 | SC-3 | 0.0137 | 32 | Poor/Fair | 52536 | | " | Poor-Fa |
| | | | 0.0226 | 50 | Poor-Fair | 52657 | | " | Very Po |
| | | | | | | 52658 | | " | Poor |
| | 52093 | SC-3 | 0.0170 | 22 | Poor | 53054 | | " | Poor |
| | | | 0.0106 | 39 | Poor-Good | 53055 | | " | Poor |
| | | | | | | 52940 | | " | Poor |
| | 50695 | SC-3 | 0.0041 | 0 | Poor-Good | 52941 | | " | Poor |
| | | | 0.0059 | 3 | Fair/Good | 52942 | | " | Poor |
| | 50810 | SC-3 | 0.0185 | 10 | Poor | | | | |
| | | | 0.0027 | 35 | Poor | | | | |
| 261 C3 | 47570 | SC-3 | 0.0079 | 40 | Fair | 52026 | | I-MC-3 | Fair |
| | | | 0.0072 | 6 | Good | 52010 | | " | Poor/Fa |
| | | | | | | 52011 | | " | Poor/Fa |
| | 51120 | SC-3 | 0.0110 | 38 | Poor | 52012 | | " | Poor/Fa |
| | | | 0.0048 | 19 | Poor | 52222 | | " | Poor/Fa |
| | | | | | | 53008 | | " | Poor/Fa |
| | 51675 | SC-3 | 0.0196 | 13 | Poor/Fair | 53009 | | " | Poor/Fa |
| | | | 0.0067 | 53 | Poor/Good | 53010 | | " | Poor |
| | | | | | | 53011 | | " | Poor |
| | 51889 | SC-3 | 0.0021 | 9 | Poor | 53012 | | " | Poor |
| | | | 0.0017 | 40 | Poor | 52431 | | " | Poor/Go |
| | | | | | | 52432 | | " | Poor/Go |
| | 52065 | SC-3 | 0.0081 | 11 | Poor | 52433 | | " | Poor/Fa |
| | | | 0.0075 | 16 | Very Poor | | | | |
| 240 D1 | 48954 | SC-3 | 0.0478 | 8 | Poor/Good | 53057 | | | Fair |
| | | | 0.0045 | 35 | Very Poor | 53058 | | | Fair |
| | | | | | | 53059 | | | Fair |
| | | | | | | 53060 | | | Fair |
| | | | | | | 53061 | | | Fair |

CORRELATION BETWEEN ORIGINAL P.S.
RESULTS AND FIELD OIL MIX SAMPLES

TABLE I (Sheet 4)

| | LABORATORY P.S. RESULTS | | | | | FIELD MIX RESULTS | | |
|---|---|---|---|---|---|---|---|---|
| Proj.No. | Lab.No. | Grade Oil | Swell | WAP | Strip | Lab.No. | Oil Grade | Strip |
| 328 $F_2$ | 51745 | SC-3 | 0.0988 | 9 | Very Poor | 53167 | | Very Poor |
| | | | 0.0042 | 24 | Very Poor | 53168 | | Very Poor |
| | | | | | | 53169 | | Very Poor |
| | 48350 | SC-3 | 0.0068 | 22 | Poor/Good | 53170 | | Very Poor |
| | | | 0.0168 | 21 | Poor | 53171 | | " " |
| | | | | | | 53172 | | " " |
| | 52568 | SC-3 | 0.0062 | 12 | Poor | 53162 | | " " |
| | | | 0.0077 | 26 | Very Poor | 53163 | | " " |
| | | | | | | 53164 | | " " |
| | 48351 | SC-3 | 0.0225 | 11 | Poor | 53165 | | " " |
| | | | 0.0116 | 18 | Poor | 53166 | | " " |
| | | | | | | 53044 | | " " |
| | 48002 | SC-3 | 0.0123 | 29 | Poor | 53045 | | " " |
| | | | 0.0042 | 10 | Good | 53046 | | " " |
| | | | | | | 52810 | | " " |
| | 48352 | SC-3 | 0.0300 | 17 | Poor | 52811 | | " " |
| | | | 0.0069 | 17 | Fair | 52812 | | " " |
| | | | | | | 52813 | | " " |
| | 48339 | SC-3 | 0.0084 | 34 | Poor | 52814 | | " " |
| | | | 0.0025 | 31 | Poor | 52815 | | " " |
| | | | | | | 52816 | | " " |
| | 51511 | SC-3 | 0.0029 | 33 | Fair/Good | 52817 | | " " |
| | | | 0.0030 | 28 | Poor/Good | 52915 | | Poor |
| | | | | | | 52916 | | " |
| | 48340 | SC-3 | 0.0148 | 36 | Poor/Good | 52917 | | " |
| | | | 0.0032 | 31 | Poor | 52918 | | " |
| | | | | | | 52919 | | " |
| | 48341 | SC-3 | 0.0106 | 32 | Poor/Fair | 52920 | | Poor/Fair |
| | | | | | | 52921 | | " |
| | 49344 | SC-3 | 0.0210 | 23 | Very Poor | 52664 | | Very Poor |
| | | | 0.0124 | 22 | Poor | 52665 | | " " |
| | | | | | | 52666 | | " " |
| | 48345 | SC-3 | 0.0357 | 20 | Very Poor | 52667 | | " " |
| | | | 0.0166 | 4 | " " | 52668 | | " " |
| | | | | | | 52560 | | " " |
| | 48346 | SC-3 | 0.0169 | 12 | Poor/Fair | 52561 | | " " |
| | | | 0.0191 | 29 | Poor | 52562 | | " " |
| | | | | | | 52563 | | " " |
| | 48348 | SC-3 | 0.0074 | 10 | Poor/Good | 52564 | | " " |
| | | | 0.0091 | 30 | Poor | 52565 | | " " |

CORRELATION BETWEEN ORIGINAL P.S.
RESULTS AND FIELD OIL MIX SAMPLES

TABLE I (Sheet 5)

| | LABORATORY P.S. RESULTS | | | | | FIELD MIX RESULTS | | |
|---|---|---|---|---|---|---|---|---|
| Proj.No. | Lab.No. | Grade Oil | Swell | WAP | Strip | LabNo. | %Oil Grade Oil | Strip |
| 328 $F_2$ | 48349 | SC-3 | 0.0101 | 7 | Poor | 52566 | | Very Poor |
| $B_2$ | | | 0.0137 | 23 | Poor | 52567 | | " " |
| | | | | | | 52607 | | " " |
| | 51743 | SC-3 | 0.0310 | 15 | Poor/Fair | 52608 | | " " |
| | | | 0.0031 | 37 | Poor/Fair | 52523 | | " " |
| | | | | | | 52524 | | " " |
| | 48356 | SC-3 | 0.0063 | 21 | Poor | 52525 | | " " |
| | | | 0.0062 | 14 | Poor | 52275 | | Poor/Fair |
| | | | | | | 52276 | | Poor/Fair |
| | 51745 | SC-3 | 0.0988 | 0 | Very Poor | 52277 | | Very Poor |
| | | | 0.0043 | 24 | Very Poor | 52278 | | Poor |
| | | | | | | 52279 | | Poor |
| | | | | | | 52280 | | Very Poor |
| | | | | | | 52281 | | Very Poor |
| 4 $A_1$ | 51606 | SC-3 | 0.0041 | 4 | Good | 52670 | H-SC-3 | Good |
| | | | 0.0066 | 37 | Poor | 52733 | " | " |
| | | | | | | 52734 | " | " |
| | | | | | | 52735 | " | " |
| 178 $A_2$ | 50202 | SC-3 | 0.0133 | 2 | Poor/Good | 51879 | | Poor/Fair |
| | | | 0.0057 | 34 | Poor/Good | 51880 | | Poor |
| | | | | | | 52133 | | Poor |
| | 50206 | SC-3 | 0.0300 | 37 | Poor | 52134 | | Poor/Fair |
| | | | 0.0068 | 37 | Poor | 52154 | | Poor/Fair |
| | | | | | | 52155 | | Poor/Fair |
| | 50207 | SC-3 | 0.0340 | 45 | Poor | 52156 | | Poor/Fair |
| | | | 0.0012 | 41 | Poor/Good | 52243 | | Very Poor |
| | | | | | | 52282 | | Poor/Fair |
| | 50208 | SC-3 | 0.0222 | 36 | Poor | 52299 | | Poor |
| | | | 0.0058 | 38 | Poor | 52300 | | Very Poor |
| | | | | | | 52301 | | Very Poor |
| | 50209 | SC-3 | 0.1172 | 35 | Very Poor | 52302 | | Very Poor |
| | | | 0.0186 | 43 | Very Poor | 52410 | | Very Poor |
| | | | | | | 51249 | Y-SC-4 | Poor/Fair |
| | | | | | | 51250 | " | Fair |
| 53 $A_2$ | 51539 | $S_c$-3 | 0.0036 | 2 | Fair/Good | 51353 | " | Poor/Fair |
| | | | 0.0057 | 39 | Poor | 51354 | " | Poor/Fair |
| | | | | | | 51355 | " | Poor/Fair |

TABLE II

| Lab. No. | 47906 | 47907 | 47908 | 47909 | 47910 | 47911 | 47955 | 47956 | 47957 |
|---|---|---|---|---|---|---|---|---|---|
| -3/4+4 | 47.5 | 46.0 | 46.6 | 54.4 | 44.7 | 36.5 | 42.4 | 35.8 | 40.0 |
| -4 + 10 | 13.1 | 12.9 | 11.9 | 10.3 | 14.2 | 26.4 | 19.0 | 19.9 | 20.0 |
| -10 +40 | 15.1 | 15.6 | 15.0 | 13.2 | 16.2 | 10.6 | 19.0 | 18.4 | 19.0 |
| -40 + 200 | 14.3 | 14.9 | 15.7 | 12.8 | 14.6 | 9.1 | 11.2 | 11.8 | 10.7 |
| -200 | 10.0 | 8.6 | 8.8 | 7.7 | 8.3 | 7.4 | 6.5 | 10.1 | 10.3 |

| Lab. No. | 47958 | 47959 | 47960 | 47961 | 47912 | 47995 | 47996 | 47997 | 47998 |
|---|---|---|---|---|---|---|---|---|---|
| -3/4 + 4 | 43.5 | 38.7 | 43.5 | 42.7 | 38.6 | 45.3 | 34.9 | 39.5 | 35.0 |
| -4 + 10 | 21.7 | 22.2 | 17.0 | 16.1 | 19.4 | 21.5 | 27.3 | 24.3 | 27.2 |
| -10 + 40 | 20.3 | 19.5 | 20.3 | 19.2 | 19.6 | 14.7 | 17.2 | 15.6 | 19.5 |
| -40 + 200 | 10.2 | 9.2 | 11.2 | 12.5 | 12.1 | 10.9 | 11.1 | 9.4 | 10.5 |
| -200 | 5.3 | 8.7 | 8.0 | 8.4 | 9.8 | 7.6 | 8.7 | 6.5 | 7.8 |

| Lab No. | 48103 | 46104 | 46105 | 48106 | 46107 | 48102 | 48151 | 46152 | 46153 |
|---|---|---|---|---|---|---|---|---|---|
| -3/4 + 4 | 49.2 | 45.7 | 46.0 | 39.5 | 40.9 | 39.9 | 41.3 | 40.4 | 37.6 |
| -4 + 10 | 19.1 | 22.3 | 20.0 | 21.1 | 20.1 | 21.3 | 23.6 | 23.1 | 24.9 |
| -10 + 40 | 12.6 | 15.6 | 14.0 | 18.3 | 16.5 | 17.6 | 14.1 | 13.5 | 16.5 |
| -40 + 200 | 9.1 | 9.5 | 12.0 | 12.5 | 13.6 | 12.9 | 13.0 | 13.5 | 12.0 |
| -200 | 7.2 | 6.3 | 8.0 | 7.0 | 8.9 | 5.6 | 8.0 | 9.5 | 9.0 |

| Lab. No. | 48154 | 48155 | 46156 | 48389 | 48390 | 40391 | 48392 | 48393 | 46394 |
|---|---|---|---|---|---|---|---|---|---|
| -3/4 + 4 | 47.5 | 40.8 | 41.3 | 42.6 | 51.0 | 51.8 | 41.2 | 49.4 | 47.5 |
| -4 + 10 | 20.6 | 24.6 | 23.5 | 26.1 | 14.0 | 12.6 | 26.1 | 23.3 | 22.5 |
| -10 + 40 | 11.8 | 15.2 | 14.4 | 19.9 | 22.0 | 26.5 | 21.0 | 16.5 | 18.1 |
| -40 + 200 | 11.1 | 14.4 | 11.8 | 6.6 | 8.0 | 7.1 | 6.6 | 6.0 | 6.4 |
| -200 | 6.9 | 5.0 | 9.0 | 4.8 | 5.0 | 2.0 | 3.1 | 4.4 | 5.5 |

| Lab. No. | 48395 | 48396 | 48396 | 47878 | 48675 | 40169 | 48398 | 47913 | 47914 |
|---|---|---|---|---|---|---|---|---|---|
| -3/4 + 4 | 42.7 | 30.0 | 33.2 | 34.5 | 36.8 | 33.4 | 30.3 | 38.7 | 42.6 |
| -4 + 10 | 14.3 | 36.5 | 28.2 | 24.0 | 20.6 | 15.9 | 16.9 | 19.6 | 20.9 |
| -10 + 40 | 24.4 | 16.3 | 18.5 | 20.3 | 20.3 | 24.5 | 31.5 | 23.2 | 19.5 |
| -40 + 200 | 8.9 | 6.9 | 8.4 | 12.0 | 13.4 | 15.0 | 12.8 | 10.5 | 9.5 |
| -200 | 4.1 | 4.6 | 6.2 | 6.2 | 7.5 | 6.4 | 5.2 | 8.0 | 7.5 |

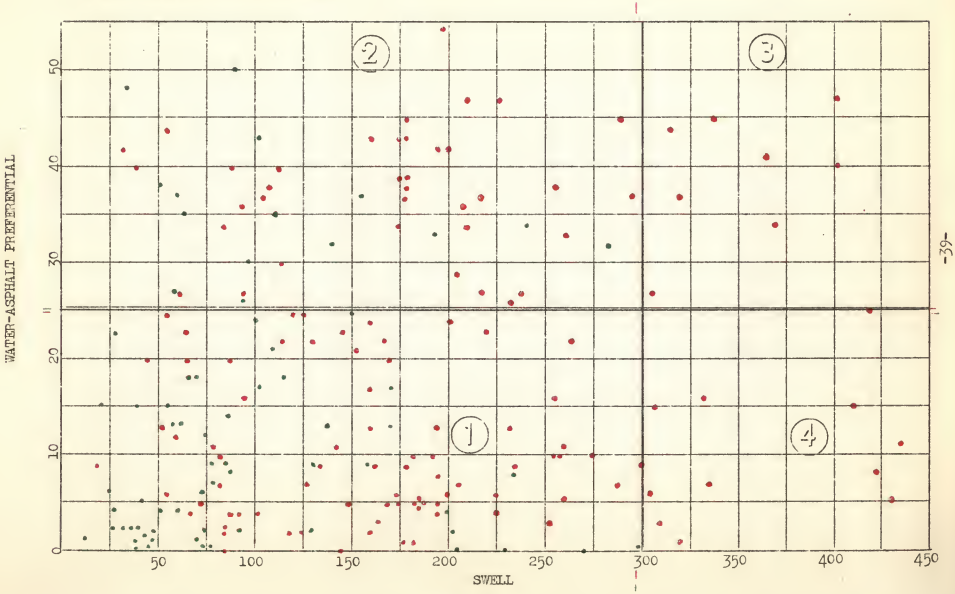
| Lab No. | 47915 | 46916 | 48490 | 48491 | 48531 |
|---|---|---|---|---|---|
| -3/4 + 4 | 38.4 | 35.6 | 45.5 | 43.8 | 44.1 |
| -4 + 10 | 21.4 | 21.9 | 13.9 | 13.6 | 13.7 |
| -10 + 40 | 22.6 | 24.0 | 6.7 | 7.2 | 7.1 |
| -40 + 200 | 9.6 | 9.7 | 26.6 | 30.2 | 30.3 |
| -200 | 8.0 | 7.8 | 5.3 | 5.2 | 4.8 |

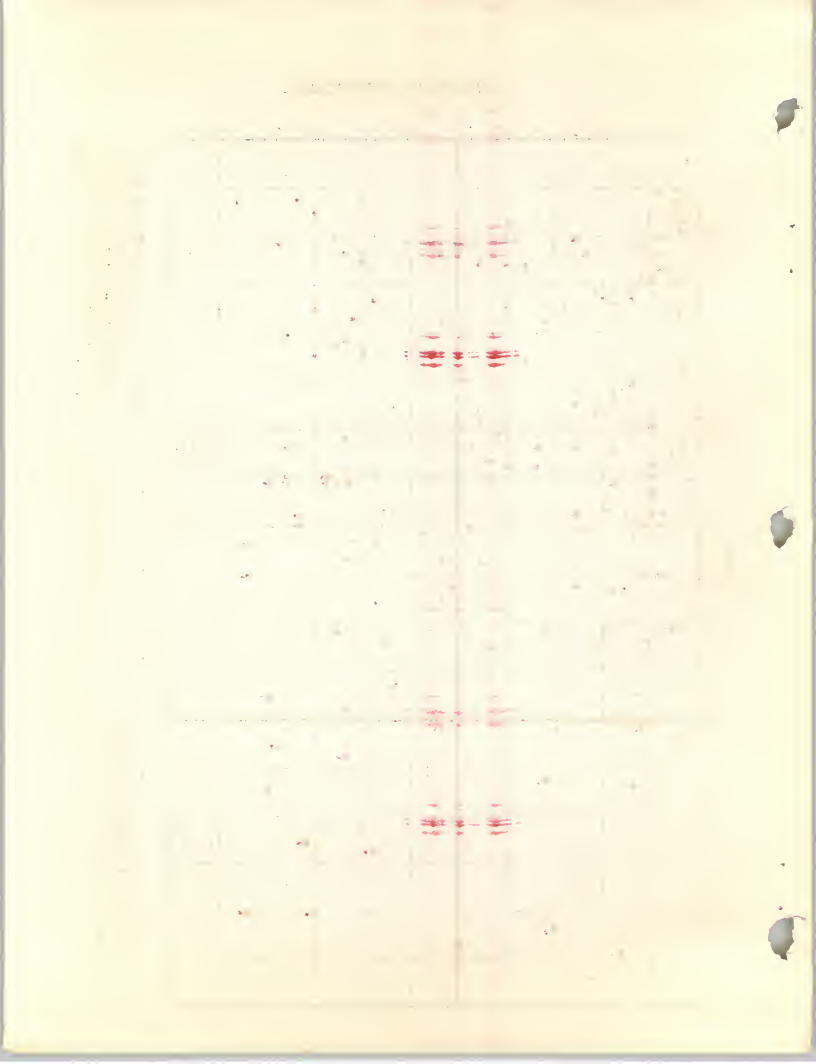
| Laboratory Grading | |
|---|---|
| -3/4 + 4 | 47.0 |
| -4 + 10 | 11.0 |
| -10 + 40 | 17.0 |
| -40 + 200 | 15.0 |
| -200 | 10.0 |

Legend:
1. Within Specifications.
2. Within Swell-Outside W.A.P.
3. Outside Specifications
4. Within W.A.P. - Outside Swell

NATURAL AGGREGATE
CHART #I

Green dots signify good strips.
Red dots signify poor strips.





Legend:
1. Within Specifications.
2. Within Swell-Outside W.A.P.

MANUFACTURED AGGREGATE
CHART #II

Green dots signify good strips.
Red dots signify poor strips.